

I. THE BIRDS OF PYMATUNING SWAMP AND CONNEAUT LAKE, CRAWFORD COUNTY, PENNSYLVANIA.

BY GEORGE MIKSCH SUTTON.

(PLATES II-XI)

PREFATORY.

There is about every wooded swamp or open marsh an alluring mystery. Here rank vegetation forms a screen behind which strange events may happen; walking is often difficult and unpleasant; and bothersome insects sometimes abound. These features deter the casual sportsman or wanderer, and thus afford for wild-life a sanctuary where human interference is rare. Every naturalist knows that in a swamp he will find conditions for the most part undisturbed by civilization, and the larger the swamp the more undefiled will be every aspect of nature.

In a region so densely populated as Pennsylvania, and boastful, as it is, of an army of hunters unequalled in number by any state in the Union, any large wilderness affords a welcome refuge, toward which the persecuted wild-life instinctively moves in its desire to live and bring forth young unmolested.

Prior to the year 1922 the mere mention of Pymatuning Swamp provoked the greatest interest in the writer. From all that could be gathered the place was scientifically almost unknown, although the scant reports of Mr. W. E. Clyde Todd, Curator of Ornithology in the Carnegie Museum, who had paid brief visits to the region during the month of June in 1895, 1897, 1898, and 1899, and who persuaded the writer to undertake the present study, were sufficient to show that an ornithological survey of the area would merit much effort.

Mr. Todd, so far as the writer can ascertain, was the first ornithologist who critically inspected this swamp, and it is regrettable that his studies were necessarily limited, because at the time of Mr. Todd's visits certain birds occurred in abundance, which are now very rare or absent. Mr. Milo H. Miller, Principal of the Public

Schools, Knoxville, Pittsburgh, was also an early investigator of the Pymatuning Swamp, but was not, at the time of his earlier visits, particularly interested in preserving data bearing on bird-life. During more recent years he has been an active observer.

Not only did the Swamp, as a wild area in many ways unique in Pennsylvania, appeal to the writer, but it was also recognized as furnishing an opportunity for comparing ecological conditions and dates of migration with those found by Mr. Todd at Erie.¹ When therefore, the Carnegie Museum found it possible to sponsor field-work in the Swamp for the spring of 1922 all possible haste was made to assemble the necessary equipment and to establish headquarters at the Century Inn at Hartstown, a pleasant little village situated near the southern end of the Swamp. Upon request a friend of the writer, Mr. John G. Thomas, then of Buffalo, New York, and now (1927) of Asheville, North Carolina, not only joined in the field-work, but actually preceded the writer several days, in order to roughly survey the region. Mr. Thomas, aside from being a delightful and indefatigable companion, was the means of adding many interesting specimens to the collection and numerous notes to the data gathered. He was in the field practically all the time and found many nests which otherwise might never have been found. He assisted in reaching nests which were difficult of access, in bringing in the collected material, and in preparing specimens. Although comparatively few birds were collected at this time (in fact, only enough to authenticate certain merely ocular identifications, or to supply necessary material for the educational work of the Carnegie Museum), a large and almost completely representative collection of nests and eggs was made, and hundreds of nests were found which were not disturbed. Our visit in 1922 extended from April 27 to June 4, and this survey covered the period of the spring-migration fairly well.

Subsequent to this preliminary visit, Messrs. Norman McClintock, Todd, and the writer made a trip to Hartstown during May of the following year (1923). We were in the field from May 15 to May 18. On May 29, 1923, Messrs. John B. Semple, Bayard H. Christy, Walter C. Miller, and the writer again made a short visit at the invitation of Mr. Semple. During this visit we camped on the north-

¹The Birds of Erie and Presque Isle, Erie County, Pennsylvania, W. E. Clyde Todd, *Annals of the Carnegie Museum*, Vol. II, 1904, 481-596.

ern shore of Crystal Lake, not far from Hartstown, and remained until June 1. On June 15, 1923, while gathering material for the Carnegie Museum habitat-groups of birds, Messrs. Arthur W. Henn, Gustave and John Link, and the writer again visited the region, remaining until June 19. During all of these visits much assistance was rendered by Mr. Merl Hutchens, son of the proprietor of the Century Inn, who accompanied us on many of the trips. Dr. O. E. Jennings, in connection with his botanical field-work in the region, obtained interesting data on its bird-life from time to time. During 1924 a short but important visit was made from May 30 to June 1, by Messrs. Fred L. Homer, M. Graham Netting, and the writer.

In 1925 from February 18 to 21 the writer made his first winter visit to the Swamp and many interesting records were obtained. Messrs. George M. Langdon and C. Albert Bergstrom, of the field-force of the Pennsylvania State Board of Game Commissioners, were of much assistance at this time, and a little inquiry brought to light many interesting notes already in their possession. Both of these men, from February, 1925, onward, spent much time in gathering additional data, and a great deal of credit is due them for their painstaking and whole-hearted labors.

Mr. Langdon, who was at that time the State Game Protector in charge of Crawford County, was tireless in his study of the Conneaut Lake region in particular, and spared no pains in tracing specimens taken locally, in intelligent inquiry among the residents of nearby villages, and in carefully collecting specimens, which were promptly turned over to the writer. Mr. Langdon had an automobile and motor-boat at his command, which aided materially in the work.

Mr. Bergstrom, at that time the Assistant Game Protector of Crawford County, living at Shermansville, had ready access to Pymatuning Swamp, and was diligent in carefully keeping dates of migration, in tracing reports of rare or interesting birds, and in making a conservative collection of specimens.

From May 14 to 18, 1925, every available moment was spent by the writer in the field, and during this visit the whole region under consideration was rather intensively studied. On May 24 and 25, 1925, the Audubon Society of Western Pennsylvania held an outing at the Swamp, and listed numerous species. On June 1 Messrs. Ernest G. Holt and Graham Netting visited the Swamp for the purpose of collecting in various orders for the Carnegie Museum,

and their records as to birds which were observed have been turned over for inclusion in this paper. The writer spent the fall of 1925 at Pymatuning Swamp and Conneaut Lake, the exact dates being August 21-October 1. During this sojourn trips were made through all the surrounding country.

In 1926 an early spring reconnaissance was made from March 26 to April 4. Mr. Langdon and Mr. Bergstrom continued their careful observations throughout the spring and summer during the absence of the writer from the United States.

During February, 1927, the entire region was cursorily surveyed, and from June 29 to July 3, 1927, Messrs. Semple, Christy, Langdon, Bergstrom, and the writer studied the Swamp intensively.

During February, May, August, and September of 1925, and March-April, 1926, as well as three times previously in 1922, Conneaut Lake and its neighboring marshes were visited by the writer. In view of the similarity of this region to Pymatuning Swamp, and the likeness of the bird-life in the two sections, it has been decided to include in this report references to the region surrounding Conneaut Lake and Pymatuning Swamp as far as Meadville to the northeast, Harmons ville and Linesville to the north, Espyville to the west, Custards to the southeast, and Adamsville to the south. A trip to Sandy Lake in 1924 (made at the invitation of Mr. Homer) made it evident that the borders of Sandy Lake were ecologically similar to Pymatuning Swamp, and therefore remarks on that locality are included, although in a parenthetical way.

The excellent notes of Mr. Harry C. Kirkpatrick of Meadville, covering a period of over fifty years, while not all included in the present work, have been freely consulted with their author's permission. These records are of particular interest because of the long period which they cover. The work of Mr. Kirkpatrick was partly done in connection with that of the late Hon. George B. Sennett, who was a former resident and visitor in the section for several years. Mr. Kirkpatrick has not visited the Swamp a great deal; but his Meadville records are of particular value in comparing dates of arrival, etc., with the dates obtained by more recent observers. Mr. Kirkpatrick very patiently went over the entire manuscript of the present paper, correcting some statements and adding others. His biographical remarks are of especial interest. Mr. Edgar Huidekoper also has many interesting records for the vicinity of Meadville, and

most of these have been included. His collection of mounted specimens, while not large, is in excellent condition.

Among the most valued additions to the notes on the region are those furnished by Mr. G. Ernest Welshons of Pittsburgh, who has done considerable hunting at Conneaut Lake and a great deal of taxidermic work for men who have hunted there. A large part of Mr. Welshons' collection may now be seen in the dining-room of the Iroquois Hotel at Conneaut Lake; many other specimens are in one of the upper rooms of the same building. Mr. Welshons has retained several rarities in his private collection in Pittsburgh, and many others have found their way to other cities, as Detroit and Cleveland. The late Mr. Rufus C. Adams of Conneaut Lake Park made an excellent collection of local water-birds, many of which are still extant in the Oakland Beach Hotel. This collection, which is in good condition, contains several rarities, and at least one unique record.

Mr. R. L. Keesler of Forestville has made several trips to the region and has furnished numerous records, particularly concerning the water-fowl at Conneaut Lake. Mr. Ralph J. Ferris of Linesville has kindly contributed data concerning species formerly found at Pymatuning. Mr. J. G. Crumb, who lives near Linesville, formerly assembled a very interesting collection of "single" eggs, which includes some great rarities. It is fortunate that this valuable collection was examined. The ornithological notes assembled by Mr. F. Cecil First while he was a student at Allegheny College at Meadville have been fully consulted with the permission of Dr. C. A. Darling, who is in charge of the Department of Biology in that institution. The Allegheny College Museum also possesses certain nests and eggs collected by Mr. John C. Bird near Meadville; the dates of collection of many of these have been included. Mr. C. J. Seiple and J. J. Donaldson of Greenville have furnished data gathered on their several trips to the region. Many interesting records have come to light from an examination of the files and hunters' reports of the Pennsylvania State Game Commission.

Certain remarks made in Dr. B. H. Warren's "Birds of Pennsylvania" have concerned this part of the State, and these have been consulted. Published records of the birds of the Pymatuning Swamp and Conneaut Lake are, however, very few; in fact there have been practically none since 1913, save those of the writer. Prior to 1913

articles of general interest appeared in the magazines "In the Open" and "Forest and Stream" from the respective pens of Messrs. Stone, Miller, Sansom, and Putnam.

It is regrettable that careful field-work was not done in Pymatuning Swamp and at Conneaut Lake forty years ago. At that time many square miles of tamarack growth, which is now dead, was flourishing. Portions of the Swamp now denuded of their trees, or drained, were then teeming with animal life. Certain species of birds then common (exclusive of those which are now known to be exterminated), such as the Woodcock and Pileated Woodpecker, are now much rarer, and locally almost extirpated, so that our recent studies are a little late and must be considered as bearing chiefly upon the species now present, and not upon those which may have been present in the past.

Plans are under consideration for creating a large lake in the region by damming the streams at certain points. If these dams are erected a large portion of Pymatuning Swamp, as it now exists, will be a thing of the past. Knowledge of this impending mutilation of the region has energised our field work.² Such a wide expanse of water may, as those interested in the dam have said, form a wonderful refuge for many species of water-fowl; but just as certainly will it destroy forever the home of numerous interesting birds, which possibly occur nowhere else in Pennsylvania as summer-residents. For many reasons, therefore, it has been thought advisable to give to the scientific world, as well as to the public of Pennsylvania, an accurate account of the bird-life of this remarkable region as it now exists. Decimated as the bird-population of Pymatuning Swamp may be at the present time, there are probably more species of breeding birds in this restricted area, and more individual nesting birds per square mile, than there are in any area of similar size in Pennsylvania.

With very few exceptions, the present list follows the sequence and nomenclature of species as given in the "Check-List of North American Birds" published by the American Ornithologists' Union,

²The region about Hartstown, including all the Swamp to the northward for about three miles, will be virtually unaffected by the projected dam. Therefore this part of Pymatuning will likely remain more or less in its present state for years to come. Any marked change in drainage conditions will, however, certainly in time change the aspects of the region.

with published changes, which have been formally accepted by the Committees in charge of such matters. A few species, which have been imperfectly identified in the field, or the presence of which is to be expected, because of their known occurrence nearby, are included in their proper places, enclosed in brackets, with appropriate statements concerning their normal range.

Besides the above named persons who have helped to amass the data used in this paper, many citizens of Hartstown deserve thanks for their efforts in our behalf. Mr. B. K. Baker, Mr. and Mrs. R. E. Hutchens, Mr. E. E. Hunter (now deceased), Mr. W. A. Ellis, and Mr. L. M. Shaffer may be mentioned in particular. A word of praise is surely due to Mr. Arch Bristow of Conneaut Lake Park (now, 1927, of Warren, Pa.) for his untiring efforts through the press in seeking the coöperation of the public in preserving the beauties and unique features of the region. Messrs. C. A. Burch, E. W. McGill, Herbert Borrell and Mayor J. E. Reynolds of Meadville have most courteously given their support. Dr. Jennings, Mr. Kirkpatrick, and Mr. Todd have kindly examined and offered suggestions concerning the manuscript. For clerical assistance Miss Ruth Trimble of the Carnegie Museum and my assistants, Mr. Leo A. Luttringer, Jr., and Miss Mildred Bogar, of Harrisburg, are hereby tendered my thanks. Finally I wish to express to my good friend, Dr. W. J. Holland, my appreciation of his painstaking and sympathetic revision of the original manuscript of this paper, and of the care he has taken in overseeing its progress through the press.

GENERAL INTRODUCTION.

GENERAL SURVEY OF THE REGION. PLS. III-VI, XI.

Crawford County occupies an area of one thousand and thirty-eight square miles in the extreme northwestern part of Pennsylvania, just south of Erie County, and consequently near Lake Erie. It is bounded along its entire western front by Ashtabula County, Ohio, and has, in general, about the same rolling character as western Warren, Venango, Mercer, and Erie Counties, which lie about it. Agriculture is the chief industry, although there are some lumbering and manufacturing activities. Meadville, the county seat, located almost in the center of the county, is a prosperous town of about twenty thousand inhabitants. Our field-work was confined to the

southwestern corner of the county from Meadville south to the Mercer County line, and west to Ohio, and centered in a wet, largely uninhabited region, known as Pymatuning Swamp.

PYMATUNING SWAMP.

The word "Pymatuning,"³ while perhaps not correctly spelled or divided, is at least a suggestive perversion of the Delaware Indian word or words meaning *The Crooked-mouthed Man's Dwelling Place*, or according to some authors, simply *The Man with the Crooked Mouth*. Whether this has reference to the Swamp as the home or hunting-ground of a former Chief or Medicine Man, or of a mere hunter, is hard to say with certainty. Indians formerly lived all through the region and doubtless regarded the Swamp as an important hunting-ground for many kinds of game. Whatever the above translation may refer to, it is at least interesting to speculate upon a possible connection between it and the present term "Crooked" Creek, which is applied to the stream, which supplies the main drainage for the eastern arm of the Swamp. It is true that this stream winds about considerably, although such meandering hardly merits the term "crooked"; but there may be some connection between the two words, as suggested above.

Pymatuning Swamp has been given the colloquial name "Shenango Swamp," which, so far as I can determine, is not properly to be applied to the region under consideration, but rather to swampy areas elsewhere along the Shenango River, or, if applied to the present area, to the western arm of the Swamp, which follows this river. The term *Shenango* is the Americanized spelling for *Chenango* of the Delaware tribe, which meant *Bull Thistle*.⁴

Mr. Charles H. Stone, writing in the magazine "In the Open" (Vol. 1, September, 1911, pp. 15 and 16) relates so entertainingly a legend of the creation of Pymatuning Swamp that his words are quoted here: "I cannot swear to the truth of the legend, but it comes to me from somewhere that the Big Chief 'Pymatuning', Big Father of the Delaware Indians, had it from the Great Chief of all the

³Sometimes spelled *Pymatuming* or *Pumatuning*.

⁴For the above explanation of the Indian words the writer is indebted to Dr. George P. Donehoo, former State Librarian of Pennsylvania, and present Director of the Bureau of World War Records.

Indians, that a great river came from the land that was in Pymatuning's time, the land of the Beavers and the Wyandottes, and flowed into the Great Lakes in what was then the land of the Mohicans and Hurons. Pymatuning went in search of this great river. It was in the dry season and finding himself far to the south of the Lake country and without water to quench his thirst, he returned. Pymatuning had been so long without water that his mouth was twisted. He called all the tribes together to dig a great mouth from the great Lake water for the dry country in which he had suffered, and so this great hole came to be called 'Pymatuning'.

Pymatuning, a wooded bog of considerable local fame, forms a crescent roughly somewhat over fifteen miles in length, and varying in width (usually about a mile, and not exceeding three miles) extending from Adamsville northward, past Hartstown and Shermansville almost to Linesville, and thence northwest and west to the west of Espyville, and in a narrow and variable belt to Westford, and farther south. The swampy area is not, of course, always clearly defined, and there are numerous indentations of farming land entering the Swamp, as well as ramifications of the low, wet bogs through the surrounding drier country. The Swamp covers about twenty-five square miles (10,400 acres, according to the report of the Pennsylvania State Water Supply Commission, p. 7), the widest portions of which are south and west of Linesville. The Swamp is drained by the Shenango River, one branch of which takes its water from the northern and westward portions through a shallow channel running first to the north, and then after a complete curve westward, to the south, where eventually at Greenville it is joined by Crooked Creek which has in a circuitous bed sloping southward drained the eastern arm. The divide, which marks the source of the northward-westward and eastward-southward drainage, is not easily determined, and may, in fact, vary according to the amount of rainfall, the retentive power of the vegetation and humus, barometric pressure, or other local conditions. It is said that certain portions of Crooked Creek, at its supposed source, may flow at one time to the north, and at another time to the south. This interesting phenomenon is said to have been observed near Hartstown, where the divide occurs. Here the streams may flow quite rapidly in well defined channels, although the region about them is covered with quiet water of varying depth.

The elevation of Pymatuning Swamp above sea-level is about 1,000 feet, or about 430 feet higher than Lake Erie. The high portions in and adjacent to the Swamp to the eastward, in which the Shenango River rises, slope rather abruptly; this gives the small stream a thirty foot fall in about a quarter of a mile before it starts its tortuous way through the Swamp. In the Swamp the river is said to descend at the rate of about 2.4 feet per mile.⁵ This is, of course, a very gradual drop.

There is abundant indication that Pymatuning in preglacial times was a valley, through which a stream drained northward to Lake Erie. This stream was dammed by recessional moraines and glacial drift, and the drainage was forced southward after the formation of a lake which gradually disappeared, as it was filled with deposits which were washed into it and with dying vegetation and the soil which resulted therefrom. Near Hartstown are three small lakes, and elsewhere there are ponds, which are probably the remaining open surfaces of the much larger body of water which extended in former years over the present entire low, swampy area. The process of filling in the lake has been completed in much of the area, but the "quaking bogs" mark spots where the bottom has not yet solidified. There are numerous such bogs in Pymatuning, and portions of the edges of the lakes are so noticeably of this character that it is evident the shores are false and cover many feet of water with only a slight vegetational shell. The lakes near Hartstown are said to be very deep.

A much-used line of the Bessemer and Lake Erie Railroad runs through the Swamp from Adamsville north to Linesville. When their road-bed was being laid much difficulty was experienced in reaching solid bottom, even in the apparently firmer regions. Not only would their embankments nightly sink beneath the surface, but even whole freight cars disappeared. Eventually, it is said, a solid bottom was found after spliced piles were sunk to a depth of 200 feet; but even today it is necessary to continue the filling-in process, and the tracks may sink noticeably in certain spots. Many heavy freight-trains are carried over these tracks, and it is evident to anyone standing on the ground nearby during the passing of the train, or to anyone lying abed in the hotel at Hartstown, that the

⁵Report of Pennsylvania State Water Supply Commission, p. 29.

ground is infirm, since there is a perceptible shaking or rolling motion of the earth, which causes a trembling of the vegetation, and even a swaying of the buildings. Progress over some of the "quaking bogs" is very difficult and more than once the writer has gone through the surface-shell of vegetation, and in the thin ooze about his feet encountered a feeling of great insecurity. The beds of some of the streams, such as Crooked Creek, are in spots, however, remarkably firm, possibly due to the close intertwining of roots of the characteristic water-plants.

The spongy, retentive nature of the soil all through the Pymatuning Region means that swift and damaging floods are unusual; nevertheless large parts of the area are subject to periodic inundations, which may cover the roads crossing the Swamp, and sometimes flood the pasture-lands to a depth of several feet. The porosity of the soil renders the flow of water in Shenango River remarkably constant, so that even in times of great drought the water-supply of this small river may be depended upon. This constant amount of water doubtless has also a certain equalizing influence upon the temperature.

At intervals in the Swamp are rises of ground which were probably never beneath the surface of the glacial lake. These are locally and perhaps correctly known as "islands". Near Jamestown, at Shermansville, and at one or two other points, there are outcroppings of rocks, which possibly indicate the existence of a gorge, through which the preglacial Old Middle Allegheny River⁶ or one of its tributaries formerly drained to the northward.

Throughout most of the wooded Swamp the characteristic features of vegetation and contour are similar. The whole region is more or less damp, and much of it is covered with water. In many portions of this wet area the prevailing growth is black alder, which is exceedingly thick and difficult to penetrate. The presence of alders often indicates a boggy condition, and jumping will shake the trees and land surface all about for a distance of several yards. The roots of these alders, treacherous, as they are, in tripping one, are about the only points of sure footing in some parts. There is much growth of alder between Hartstown and Linesville, and patches of the shrub fringe the lakes.

⁶See Leverett, *Monographs of the United States Geological Survey*, Vol. XLI, p. 132, *et seq.*, and 630, *et seq.*, as well as fig. 1, p. 89.

Near the growths of alder stands of tamarack often occur, many of which at the present time seem to be dying. These trees formerly were probably much more widely distributed through the Swamp than now. Large groves of tamaracks occur to the west and southwest of Shermansville, and there are smaller patches or occasional trees east of Hartstown, principally to the east of Lower Lake. With the tamaracks, as well as on higher ground, are to be found fine specimens of hemlock, black or cherry-birch, swamp-maple and, rarely, other species which are usually found on the uplands. West of Linesville is a beautiful grove of white pine, virtually the only such stand of timber in the region.

Between the larger trees, growing about in the swampy portions, occur black alder, red osier, dogwood, spicebush, wild-rose, poison sumac, alder-leafed buckthorn, high huckleberry, and numerous other shrubs; and there are also more open stretches of grass hummocks and sphagnum moss, which are often partly submerged. The ground about the living tamaracks seems to be rather dry, but boggy areas may occur anywhere. Skunk-cabbage is common in the wooded swampy areas, and native orchids of several species as well as other beautiful flowers often occur near the tamaracks in the particular kind of soil required by them. Ferns are abundant. The odd pitcher-plant is sometimes found. The tamarack muck, which has resulted from the decay of these trees and sphagnum moss, differs from the black ash muck which occurs where the latter tree is prevalent. The black ash growth occurs principally to the west of Linesville, where this species of tree grows abundantly.

Open marsh-lands are not common in Pymatuning Swamp, but such areas occur along the Shenango southwest of Espyville, and there are three not far from Hartstown; one just across the tracks from the town, in the old, now overgrown reservoir, which was part of the former Erie and Beaver Canal system; one about a mile southeast of Hartstown; and another south of the corduroy-road which runs from Shermansville southwest across the Swamp. In these marsh-lands marsh-grasses, sedges, and cat-tails are dominant forms of vegetation, although anywhere there may occur stands of ferns (particularly about the rotting trunks or stumps of dead trees), wild-rose bushes, alders, willows, and other shrubs. In the opener portions of such marshes, where the water is deeper and where cat-tails are consequently not growing, yellow pond-lilies, pond-weed, and arrow-

leaf occur. Marsh marigold may be abundant in the open and also in the water among the trees.

On the higher ground, which occurs about the edge of the Swamp as well as on knolls in the Swamp, grow such trees as the beech, red and black oak, black ash, swamp-maple, cucumber-tree, tulip-tree, black gum, white pine, hickory, hornbeams, and white elm. On tongues of high ground jutting out into the Swamp there often appear large clumps of trembling aspen and big-toothed aspen (of second growth undoubtedly), black locust, black walnut, and chestnut. And on the highest ground, usually back from the Swamp proper, and occurring along streams which flow through shallow gorges into the swampy region, splendid growths of beech, oak, sugar-maple, and hemlock are found.

There are three lakes near Hartstown which are of interest. They are Dollar Lake,⁷ a small circular body of water very near and to the right of the State Highway leading from Hartstown to Conneaut Lake, but encircled so thickly by trees as to make it almost invisible; Crystal Lake, the name of which does not altogether aptly describe its appearance, a larger body of water a few rods to the south of Dollar Lake, even nearer Hartstown (only a quarter of a mile east), and plainly visible from the road, though it is fringed with alders; and Lower Lake (Hidden Lake, Long Lake, or Mud Lake), probably a trifle smaller than Crystal Lake, roughly crescentic in outline, lying across the road to the south of Crystal Lake, not more than a quarter of a mile distant, but completely hidden from the road. The water of the last lake is dark and opaque in appearance. These lakes are similar in possessing oozy, poorly defined bottoms, false shores (for the most part) and heavily wooded banks. The open stretches of water afford a resting place for migratory waterfowl, but there is so little grassy or cat-tail margin about them, and sunning banks are so infrequent, that the birds are not disposed, as a rule, to linger long. About the shallower edges of these lakes spatterdock, pond-weed, and arrow-leaf occur, and even thin stands of cat-tails and burr-reeds, but these growths are never extensive. Almost at the water's edge, however, there is a border of alders, which keeps the water well hidden from view, and which is an effective wind-break. While Crooked Creek or its tributaries run through these lakes, the entrances and

⁷This lake, strangely enough, is omitted from the map of the Linesville Quadrangle.

exits are very poorly defined, save where a fair-sized stream of water leaves the southern end of Lower Lake to wander off among the alders and black birches to the more open country beyond the Swamp. Fair-sized ponds occur across the State Highway from Dollar Lake (locally called "Brush Dam Pond"); at the edge of the Swamp a half-mile south of Lower Lake; at Meadville Junction; to the northwest of Linesville; and also all along the north-bound railroad tracks from Hartstown to Shermansville where the Erie canal formerly existed, but these are not of great significance. The open stretches of the Shenango River are perhaps more important as resting places for waterfowl.

While the stream which leaves Lower Lake to flow southward is well defined, it is hidden by trees for nearly the entire length of its course. However, the stream, which flows northward to form the source of the Shenango, runs through the open much of its way after it passes the wooded swamp two miles north of Hartstown. Along this open stream, which is favored because bordered with cat-tails and similar growth, waterfowl sometimes congregate in abundance.

Throughout the whole of the wooded Swamp the soil may best be termed *humus*. It is almost entirely of vegetable origin, is very porous and spongy, and is considered of value as a fertilizer. It is not surprising therefore that a business enterprise has been afoot for some years to take this humus from the ground and to prepare it as a commercial product. This project has brought about a complete destruction of the woodlands near Hartstown directly across the railroad from the depot to the east. A large building was erected as a center for the preparation and exportation of humus about a mile north of Hartstown, along the south-bound railway tracks. About five hundred acres lying west of Linesville have, after being cleared, been with great success devoted to the culture of onions. While considerable clearing has thus been taking place, comparatively little of the Swamp has been noticeably changed in character. Little by little, however, farms have encroached, so that here and there all along the borders of the wild wastes may be found fertile truck-gardens and grazing fields.

The character of the Swamp through natural agencies has been noticeably changed during the past centuries. The alder growth first covered the surface of the lake, gradually making a dry area where larger growths might occur. Then larger trees gradually sprang up, overshadowing the alders. Among these were the tamaracks. But

certain agencies including floods, have been causing the death of these trees, so that now most of the larches are dead. Almost the whole tamarack forest west of Shermansville is completely dead or rapidly dying. These trees are very brittle and the writer once had the humiliating experience of falling from the top of one of them straight to the ground, breaking off every branch encountered *en route!*

From the edges of the Swamp the land rises rather abruptly to the open fields and pleasant woodlands of the bordering farms. Here the vegetation is of quite a different character. Wild plums, crab-apples, hawthorns, and oaks are abundant, and great elms occur along the roadsides.

Through some of these upland woods the streams have cut gorges, many of which are beautiful. The high banks of Jack's Run (west of Hartstown) are handsomely covered with tremendous hemlocks, oaks, beeches, and maples, over which grapevines often spread. The stream ripples along over limestone ledges where the bed descends rapidly to the level of the Swamp. Streams to the eastward of the Swamp, such as Calhoun's and Randolph's Runs, have cut similar deep gorges.

Several miles to the south and east of Espyville the timber has long been cut off, and the fields are wide, and more or less treeless, reminding one of the Great Plains, so level and open are they. Here again the vegetation and animal life naturally change.

Extremes of cold and heat are not especially noticeable in the region. Lake Erie, though it is thirty miles away (nearest point on shore to the northwest), undoubtedly exerts an equalizing effect on the temperature, retarding the spring season to an extent and extending the pleasant weather of the fall. The Swamp is a well sheltered place at all seasons, partly due to the surrounding rim of higher ground, with its occasional growths of trees, and partly due to its dense vegetation. In parts of the alder-thickets even a breeze is rarely felt, though the wind may be blowing very hard overhead. The winters as a rule are not severe, though this season in the higher altitudes of Warren and McKean Counties to the eastward is often rigorous. The small streams, so far as can be determined, practically never freeze over, and even during the severe winter season of 1924-25, although the crusts of snow were firm and the snow itself quite deep, the ground below was almost everywhere moist and muddy as usual. Incidentally the deep snow and its hard crust which were present in the late winter

of 1925 made progress through the Swamp the easiest within our experience, and it was actually possible to traverse certain portions of the region which formerly had been inaccessible. The open country to the west of the eastern arm of the Swamp and a little east of Westford is unprotected from the fierce winds which sweep down from the north, as is also one portion of the Swamp south of Linesville, where there is no protecting border of high ground or trees. It is noticeable that in these two localities the winter bird-life is similar, both being almost the only points at which Snow Buntings have been noted.

The streams are often open enough to permit the occasional wintering of ducks, notably of Mallards, Black Ducks, and Pintails. Food conditions throughout the Swamp are exceptionally favorable for the wintering bird-life, not only because of abundant berries and seeds, and dead wood which harbors insects, but also because much of the shrub growth is of such a nature, that, even though the snows are deep, food in the form of seeds and dried berries is practically always available. This is rather important, since in some other places a deep snow may almost cut off the food supply.

Food conditions during the summer are ideal for bird-life. Insects naturally abound. The region is of such a nature that food for hawks and owls is so readily accessible in the form of mice, frogs, etc., that the birds of prey do not, as a rule, need to resort to the nearby farm-yards nor to the valuable game-birds and mammals.

Generally speaking, the rainfall in the region is such that it is readily soaked up by the spongy soil, or drained off by the streams. The summer season of 1923 was, however, very dry everywhere, and as a result portions of the cat-tail marsh, which had been beneath twenty-four inches of water during 1922, were not only exposed, but were actually parched and cracked. While this may have brought hardship on certain of the marsh-birds, it most certainly made field-work easier, and so restricted the ponds and damp stretches that it was much easier to find such birds as rails, which are usually difficult to locate.

Pymatuning Swamp is a paradise for the student of ecology. Without attempting for the present to delve into the intricate relationship of the animal and plant life, it is worthy of note, for instance, that the presence of Wilson's Snipes, Swamp-sparrows, and Red-winged Blackbirds (as well as other species) largely depends upon the existence of cat-tail marshes. Alder Flycatchers (endowed with an un-

usually accurate name), are to be found practically nowhere, save in the alders; Northern Water-thrushes occur only in the shady wooded areas of the Swamp where the water is quiet; and Louisiana Water-thrushes only where the rapid streams run through woodland gorges. Cerulean Warblers seem to occur only where there are beech-trees. Of course hosts of other forms have their particular habitats, which are well known.

Splendid as are the food-conditions, shelter, and seclusion of the Swamp, it must be admitted, however, that its bird-life is exposed to many natural enemies. Hunting in the Swamp is too difficult to be commonly enjoyed, so *man* as a direct enemy is almost a negligible quantity. Nevertheless considerable duck-shooting takes place at the small lakes, as well as at Conneaut Lake, and Woodcock have been strenuously sought. Hawks and owls, being somewhat commoner in the Swamp than in the surrounding regions, take a limited toll of bird-life, although the most severe enemies of birds, the Great Horned Owl, Cooper's Hawk, and the Sharp-shinned Hawk, are not particularly common. English Sparrows do not occur in the Swamp and Starlings are not as yet annoyingly abundant. Crows unquestionably eat a number of eggs and young birds each season, as do the Blue Jays to a lesser extent. The Barred Owl seems to be a particular enemy of the Screech Owl, with the result that the former species is abundant, and the latter *very rare*. The House Wren, abundant in the Swamp, is probably a mild enemy of its neighbors, for it is known to prowl about, destroying the eggs or nests of other birds. The Cowbird, while seemingly abundant, does not interfere with the nesting operations of the smaller birds as much as it usually does, largely due to the fact that Red-winged Blackbirds drive the Cowbirds out of the Swamp whenever they appear, and the other birds consequently benefit. The rearing of young Cowbirds, and even the occasional destruction of eggs or young of small birds by adult or young Cowbirds does not materially affect the abundance of the species which the Cowbird parasitizes.

Some mammals, however, must certainly be serious enemies of the bird-life. Minks are quite common, and undoubtedly do some damage. Muskrats possibly include eggs and young birds in their bill of fare, along with mussel-shells and crayfish. Weasels occur, as do Opossums, Skunks, Raccoons, Red Squirrels, and occasionally half-starved house-cats. Red Foxes are locally abundant; there can be no

doubt that many a bird is captured by these wily creatures. Woodchucks, Gray, Flying, and Fox Squirrels, Chipmunks, White-footed Mice, Field Mice, shrews, moles, bats, Otters (rarely), and possibly other mammals occur, either abundantly or rarely, but they are either not common enough to be serious as enemies of birds, or have entirely innocent feeding habits. The numerous snakes, bull-frogs, turtles, and even fish, probably capture young birds as part of their food-supply. Bull-frogs, which are sometimes of very large size, and quite common, may be at times serious enemies to immature birds.

Even with this hostile array everywhere at hand, it was found that a great percentage of the eggs and young under observation were not disturbed by their natural enemies. Any tampering with nests, even by Cowbirds, was the exception, not the rule.

Strangely enough, one of the most pronounced factors, which were found to be working against the bird-life in the marshes, was the growth of the cat-tails. No less than two dozen nests of Red-winged Blackbirds were overturned by the unequal growth of the supporting leaves of the cat-tail rushes, and nests of Swamp sparrows, Song sparrows, and Maryland Yellow-throats shared at times a similar fate. Occasionally there is a terrific storm such as the hailstorm of May 23, 1925, which kills birds and smashes eggs, doubtless by the hundreds. In the dry regions about the Swamp *man* is more important as an enemy of bird-life than in the wet areas, but he is likewise a direct or indirect means of protection in many ways.

In spite of the large array of enemies and adverse conditions, which the birds must face, Pymatuning Swamp must be regarded as a wonderful sanctuary, where the drama of wild-life goes on uninterrupted.

CONNEAUT LAKE. (PL. XI.)

Due to its proximity, as well as to the similarity of ecological conditions, it has been thought wise to include the region of Conneaut Lake in the present study. This large body of water lies about nine miles to the east (a little north of east) of Pymatuning Swamp. Conneaut Marsh, at the lower end of this body of water, as well as small marshes along the western shores, are similar to the cat-tail stretches of Pymatuning Swamp, and have the characteristic alder-growths along their borders.

The lake is an oblong body about two miles long and a mile wide,

lying north and south. It is not sheltered by trees along all its shores, so that the winds are sometimes severe on its open surface, but it probably forms the most important stopping point for waterfowl in all northwestern Pennsylvania, aside from Lake Erie itself. The lake freezes over nearly every winter by late December or January, and a large harvest of ice is usually made. However, ducks and grebes return at once upon the breaking up of the ice, and water-birds of one kind or another are to be found on the lake during all its open seasons. For this reason it is a favorite shooting resort for local sportsmen and an annual fall pilgrimage to it is made by hunters from even as far away as Pittsburgh.

The small towns of Conneaut Lake and Conneaut Lake Park lie respectively at the southern and northern ends of the lake. Conneaut Lake Park has become a famous recreation place; but only a little of the shore-line has been formally treated, and one may walk a few hundred yards from the large hotels and find himself in an impenetrable alder-thicket, or up to the thighs in a primitive cat-tail-marsh. The numerous stakes and piles near the boat-houses are apparently favorite perches for gulls and terns; and particularly in spring, when there is no shooting, Coots and "Bluebills" frequent the neighborhood of the hotels, probably to secure food which is thrown out to them.

Conneaut Lake is in parts very deep. It is interesting to note that Scoters so constantly occur over these deep areas, that one may confidently infer that, where Scoters are seen under normal circumstances, the water is deep. The pond and river ducks are more frequently found along the shore, especially in the grass-lined channels. The wide marsh at the northern end of the lake is an ideal resting-place for ducks, and a "bay" a little north of the town of Conneaut Lake is usually so sheltered and secluded that ducks are abundant there.

Conneaut Marsh, like Pymatuning Swamp, is more or less inaccessible and impenetrable, particularly when it is flooded, and is therefore an important haven for the birds of the vicinity. Most conditions are so similar in this marsh to those in the opener portions of Pymatuning Swamp that it is only fair to regard the two areas as belonging to the same ecological association. Along the banks of Conneaut Creek (which drains the lake to the southeast and empties into French Creek) are numerous swampy areas and open savanna-

like flats, where in season shore-birds are to be found. Farther south, along the wooded portions of this stream, many species of land-birds nest abundantly.

SANDY LAKE.

Sandy Lake, a fairly large body of water lying in Mercer County, about twenty miles to the southeast of Pymatuning Swamp, is likewise so surrounded by a fringe of alders, and reveals such similar conditions, that a consideration of Pymatuning Swamp is hardly complete without reference to this region. Sandy Lake is round, about one square mile in extent, and lies to the west of the small town of Stoneboro. Along all the northeastern shore of this lake is a narrow cat-tail marsh. At the north end, where the water drains out slowly through a small and partly hidden stream, there is a series of alder-thickets, spatterdock-ponds, and cat-tail-marshes. Along the northwestern shore the growth is almost altogether composed of alder. At the southern end, however, the conditions are more like those of Pymatuning Swamp than elsewhere, and here occur bogs, sphagnum, pitcher-plants, tamaracks, (most of them long dead), hemlocks, black birches, standing pools of water and typical wooded swamp.

It should not be thought that boggy areas are confined to the three localities which have been particularly described in the foregoing paragraphs. At almost any favorable point along streams of any size in the same general region similar conditions may be found, so that the whole nearby territory must be regarded, if the Pymatuning Swamp area as an ecological association is to be studied and understood. While these boggy conditions occur also as far east as Titusville, and undoubtedly farther north than Meadville, it has either been impracticable to closely study these regions, or considered undesirable at the present time to depart so far from the point of greatest interest.

BIRD MIGRATION.

The migration of birds in the Pymatuning district seems not to differ particularly from that of surrounding areas. With the shores of Lake Erie so near at hand, it is doubtless true that some birds occur, either as regular migrants or as casual wanderers, which might not otherwise be found. Conneaut Lake, being a recognizable land-

mark, is undoubtedly considered an important resting and feeding ground by water-birds, notably ducks and geese. The small streams of the region may not, however, be considered of much importance as highways of travel, although it is highly probable that the Pymatuning region is visited (or crossed in flight) by birds, which customarily migrate along the Ohio River valley to the northward in their progress toward Lake Erie in spring, or toward the Ohio River in fall. Certain it is that the migrant flocks observed by us preferred the wooded Swamp to the surrounding scattered woods of the farmlands; for day after day both regions were visited and the larger flocks of migrants were always encountered in the Swamp, and often more particularly about the shores of the lakes.

On more than one morning, when we were out early in order to get a good start at the work of the day, birds were observed descending from the sky for their morning feeding periods and consequent deliberate daytime movement northward. At first (this was noted especially at the north shore of Lower Lake), it was supposed that these birds were simply crossing the lake in their quest for food. We soon observed, however, that the birds, small though their bodies appeared, were drifting down from above, and not across the lake, as first supposed. The only birds thus observed were several species of warblers and Olive-backed Thrushes.

Observations at night again and again proved that birds were passing over, though experience has seemed to show that the call-notes of birds given during the nocturnal spring migrations were neither so loud nor so insistent as those given in the fall. On several nights chirps of various kinds were noted, and on the following morning very few birds were seen. This happened so often, and the flocks of migrants seen were usually so small, that I have come to the conclusion that this particular part of Pennsylvania is largely passed over by the birds both in spring and fall, the hordes of warblers and thrushes passing along the banks of the Ohio River during one day and moving on possibly to the southern shores of Lake Erie during the following night, and therefore never showing up at Pymatuning at all. This distance of only fifty miles or more is an easy night's flight; in fact almost too brief a flight, were it not customary for the spring migration to be made in a comparatively deliberate fashion, sometimes (especially during inclement weather) in flights of only a few miles a day.

That the Pymatuning district must be very often in the fall crossed in flight without stopping seems even more plausible. The birds in their return from the north have made a long flight over Lake Erie, and rest, as residents of Erie affirm, in thousands about the trees at Erie and Presque Isle, worn out by their great exertion. They naturally recuperate thereabouts, resting and feeding for a part of the day, or perhaps for several days, and then strike out for some point far south of Crawford County, perhaps even south of Pennsylvania, as their next stopping-place.

Of course such rests and flights apply chiefly to species the migrations of which are rapidly made. No such rapid jumps are to be noted in the movements of the Fox Sparrow, the Myrtle Warbler, or Hermit Thrush, for instance, birds whose hardy natures and food-habits seem to permit them to remain about, in spite of variable, or even cold weather.

While ducks, geese, and swans probably stop at any convenient resting-point, whether it is or is not an average day's flight from Lake Erie or the Ohio River, there is no doubt that in the fall numerous (if not all) shore-birds pause on the shores of Lake Erie and then shoot directly across the State bearing toward the southeast and the Atlantic Coast or due south for a day's flight or more to suitable stopping points along the larger water-ways. This, it seems to me, satisfactorily explains the absence of the Golden and Black-bellied Plovers in the fall, in spite of their regular occurrence at Erie.

Since there is no prominent water-way connecting Lake Erie and Conneaut Lake, it is unusual for gulls and terns to visit the smaller body of water regularly in their daily wandering after food. The thirty-mile trip from Lake Erie to Conneaut Lake is an almost negligible distance, but since no water-way connects the two bodies of water, Conneaut Lake remains unknown, and consequently unvisited by most of these water-birds.

While many migrant species are thus sometimes not abundantly recorded, or are actually missing, the number of summer resident species is unusually large.

Although the list of two hundred and forty-four species, which have been recorded in this region, does not include several which might logically occur and which sooner or later most certainly will be observed, particularly in view of their common occurrence at a point so near as Lake Erie, the region has been studied carefully enough to

make it certain that we now have fairly complete knowledge of the summer residents. The species, which will be added in the future to those herein mentioned, will likely be from among the migrants and occasional stragglers which happen to wander from the shores of Lake Erie. The remote and inaccessible portions of the Swamp have been, perhaps, most carefully studied, but certainly some of the skulking forms, which often are passed by unnoticed, have escaped us up to date. Such birds as the Yellow Rail and Nelson's Sparrow have never actually been recorded, although their occasional presence can hardly be doubted.

The winter season, variable or rigorous as it may be in the region, never affects the Swamp as severely as it does the higher ground. Therefore certain species of birds, which wander southward during the cold months in adjacent areas, often spend the winter at the Swamp. It is consequently rather difficult to determine just which species may be regarded as truly *permanently* resident. I am certain after several years of observation that some species of supposedly permanently resident birds are represented by different individuals in the winter and summer months. This is unquestionably true of the Crow, Song Sparrow (to an extent) and possibly even of the Hairy Woodpecker and Blue Jay. Observation of individual birds has however indicated that the Cardinal, Downy Woodpecker, White-breasted Nuthatch, Chickadee, and some of the larger species, actually do remain in one locality throughout the year, although their numbers may be augmented by individuals from farther north during winter.

The following twenty-three species (exclusive of three forms which have been introduced: *Passer domesticus*, *Sturnus vulgaris vulgaris*, and *Phasianus torquatus* may best be regarded as permanent residents. Some of these are unquestionably migratory to an extent, for their numbers are noticeably depleted during the cold months, until with the return of warm weather, they again appear in normal abundance. Such species are denoted with the asterisk. Certain species, such as the Brown Creeper, which rarely nest, occur so much more commonly as winter visitants, that it is quite misleading to class them as permanent residents, since unquestionably the local nesting individuals move south and are replaced by birds which spend the summer farther north. One species (appropriately questioned) has been so rarely recorded that its presence throughout the year is inferred rather than known.

LIST OF BIRDS WHICH ARE PERMANENT RESIDENTS

<i>Colinus virginianus virginianus</i>	<i>Phlæotomus pileatus abieticola</i>
<i>Bonasa umbellus umbellus</i>	<i>Centurus carolinus</i>
<i>Meleagris gallopavo silvestris</i> (formerly)	<i>Otocoris alpestris praticola</i>
<i>Buteo borealis borealis</i>	* <i>Cyanocitta cristata bromia</i>
<i>Asio otus wilsonianus</i>	* <i>Corvus brachyrhynchos brachyrhynchos</i>
<i>Strix varia varia</i>	<i>Astragalinus tristis tristis</i>
? <i>Cryptoglaux acadica acadica</i>	* <i>Melospiza melodia melodia</i>
<i>Otus asio nævius</i>	<i>Richmondia cardinalis cardinalis</i>
<i>Bubo virginianus virginianus</i>	<i>Bombycilla cedrorum</i>
* <i>Dryobates villosus villosus</i>	<i>Sitta carolinensis cookei</i>
<i>Dryobates pubescens medianus</i>	<i>Bæolophus bicolor</i>
	<i>Penthestes atricapillus atricapillus</i>

The summer residents include one hundred and eleven species, a few of which, whose presence has been noted during the summer season, but whose nest, eggs, or young have not yet been found, are indicated by an interrogation-mark. While certain species, now regarded only as migrants, may later be found as summer residents, we believe that the present list of nesting species is fairly complete. Some of these are often recorded in winter, although the individuals wintering have probably nested much farther north. The nesting species which occur most abundantly as migrants are marked with an asterisk (*), and those which are noticeable as occasional winter visitants with a dagger (†).

LIST OF BIRDS WHICH ARE SUMMER RESIDENTS

? <i>Podilymbus podiceps podiceps</i>	<i>Bartramia longicauda</i>
†* <i>Anas platyrhynchos platyrhynchos</i>	<i>Actitis macularia</i>
†* <i>Anas rubripes tristis</i>	† <i>Oxyechus vociferus vociferus</i>
? <i>Querquedula discors</i>	<i>Ectopistes canadensis</i> (formerly)
* <i>Aix sponsa</i>	† <i>Zenaidura macroura carolinensis</i>
<i>Botaurus lentiginosus</i>	<i>Cathartes aura septentrionalis</i>
<i>Ixobrychus exilis exilis</i>	† <i>Circus cyaneus hudsonius</i>
* <i>Ardea herodias herodias</i>	* <i>Accipiter velox</i>
<i>Butorides virescens virescens</i>	† <i>Accipiter cooperi</i>
<i>Rallus virginianus</i>	† <i>Buteo lineatus lineatus</i>
* <i>Porzana carolina</i>	? <i>Buteo platypterus platypterus</i>
<i>Gallinula chloropus cachinnans</i>	? <i>Haliaeetus leucocephalus leucocephalus</i>
* <i>Fulica americana</i>	† <i>Cerchneis sparveria sparveria</i>
<i>Rubicola minor</i>	† <i>Tyto alba pratincola</i>
* <i>Capella gallinago delicata</i>	* <i>Asio flammeus</i>
? <i>Tringa solitaria solitaria</i>	<i>Coccyzus americanus americanus</i>

<i>Coccyzus erythrophthalmus</i>	<i>Petrochelidon albifrons albifrons</i>
† <i>Streptoceryle alcyon alcyon</i>	<i>Hirundo rustica erythrogastris</i>
†* <i>Sphyrapicus varius varius</i>	<i>Iridoprocne bicolor</i>
<i>Melanerpes erythrocephalus erythrocephalus</i>	* <i>Riparia riparia riparia</i>
† <i>Colaptes auratus luteus</i>	<i>Stelgidopteryx serripennis serripennis</i>
<i>Setochalcis vocifera vocifera</i>	<i>Lanius ludovicianus migrans</i>
* <i>Chordeiles minor minor</i>	<i>Vireosylva olivacea</i>
<i>Chætura pelagica</i>	<i>Vireosylva gilva gilva</i>
<i>Archilochus colubris</i>	<i>Lanivireo flavifrons</i>
<i>Tyrannus tyrannus tyrannus</i>	* <i>Lanivireo solitarius solitarius</i>
<i>Myiarchus crinitus boreus</i>	* <i>Mniotilta varia</i>
<i>Sayornis phæbe</i>	<i>Vermivora pinus</i>
<i>Myiochanes virens</i>	<i>Vermivora chrysoptera</i>
<i>Empidonax virescens</i>	* <i>Vermivora ruficapilla ruficapilla</i>
<i>Empidonax traillii traillii</i>	* <i>Compothlypis americana pusilla</i>
* <i>Empidonax minimus</i>	<i>Dendroica aestiva aestiva</i>
<i>Dolichonyx oryzivorus</i>	* <i>Dendroica magnolia</i>
<i>Molothrus ater ater</i>	<i>Dendroica cerulea</i>
<i>Agelaius phœniceus predatorius</i>	* <i>Dendroica pensylvanica</i>
<i>Sturnella magna magna</i>	* <i>Dendroica fusca</i>
<i>Icterus spurius</i>	<i>Dendroica virens virens</i>
<i>Icterus galbula</i>	<i>Seiurus aurocapillus aurocapillus</i>
<i>Quiscalus quiscula æneus</i>	<i>Seiurus noveboracensis noveboracensis</i>
†* <i>Carpodacus purpureus purpureus</i>	<i>Seiurus motacilla</i>
†? <i>Spinus pinus pinus</i>	<i>Geothlypis trichas trichas</i>
<i>Poæcetes gramineus gramineus</i>	<i>Icteria virens virens</i>
<i>Passerculus sandwichensis savanna</i>	<i>Wilsonia citrina</i>
<i>Ammodramus savaanarum australis</i>	* <i>Wilsonia canadensis</i>
<i>Nemospiza henslowii susurrans</i>	<i>Setophaga ruticilla</i>
<i>Spizella passerina passerina</i>	<i>Dumetella carolinensis</i>
<i>Spizella pusilla pusilla</i>	<i>Toxostoma rufa rufa</i>
†* <i>Junco hyemalis hyemalis</i>	<i>Troglodytes ædon ædon</i>
<i>Melospiza georgiana</i>	<i>Cistothorus stellaris</i>
† <i>Pipilo erythrophthalmus erythrophthalmus</i>	<i>Telmatodytes palustris palustris</i>
* <i>Hedymeles ludoviciana</i>	†* <i>Certhia familiaris americana</i>
<i>Passerina cyanea</i>	†* <i>Sitta canadensis</i>
<i>Piranga olivacea</i>	<i>Polioptila cærulea cærulea</i>
<i>Progne subis subis</i>	<i>Hylocichla mustelina</i>
	<i>Hylocichla fuscescens fuscescens</i>
	† <i>Turdus migratorius migratorius</i>
	<i>Sialia sialis sialis</i>

By combining the lists of permanent and summer residents we have a total of one hundred and thirty-four forms, which may be considered as nesting species.

The winter visitant species, which are represented by nesting indi-

viduals in summer, number nineteen species, and these are not indicated here. Some of the following seventeen winter visitants are sometimes most abundant during the migration season (*), and others, whose presence has been noted during the winter, may not occur throughout all the cold months, or may occur sporadically (†).

* <i>Larus argentatus argentatus</i>	† <i>Pinicola enucleator leucurus</i>
† <i>Mergus merganser americanus</i>	† <i>Loxia curvirostra pusilla</i>
† <i>Astur atricapillus atricapillus</i>	† <i>Loxia leucoptera</i>
† <i>Archibuteo lagopus sancti-johannis</i>	† <i>Acanthis linaria linaria</i>
<i>Aquila chrysaetos</i>	<i>Plectrophenax nivalis nivalis</i>
<i>Nyctea nyctea</i>	* <i>Spizella arborea arborea</i>
† <i>Otocoris alpestris alpestris</i>	<i>Lanius borealis</i>
† <i>Hesperiphona vespertina vespertina</i>	* <i>Nannus troglodytes hiemalis</i>
	<i>Regulus regulus satrapa</i>

The group best classed as migrants (for which there are to date no nesting records) number seventy-four species. Some of them (†) occur in winter irregularly, while others (*) may have bred formerly, or may occasionally breed at the present time:

† <i>Colymbus holboëllii</i>	† <i>Clangula hyemalis</i>
† <i>Colymbus auritus</i>	† <i>Oidemia americana</i>
† <i>Gavia immer immer</i>	† <i>Oidemia deglandi</i>
† <i>Gavia stellata</i>	† <i>Melanitta perspicillata</i>
<i>Larus delawarensis</i>	<i>Erisimatura jamaicensis</i>
<i>Chroicocephalus philadelphia</i>	<i>Chen hyperborea hyperborea</i>
<i>Hydroprogne caspia imperator</i>	† <i>Branta canadensis canadensis</i>
<i>Sterna hirundo</i>	<i>Cygnus columbianus</i>
* <i>Chlidonias nigra surinamensis</i>	* <i>Rallus elegans elegans</i>
<i>Phalacrocorax auritus auritus</i>	* <i>Creciscus jamaicensis jamaicensis</i>
* <i>Mergus serrator</i>	<i>Lobipes lobatus</i>
* <i>Lophodytes cucullatus</i>	<i>Calidris canutus rufus</i>
† <i>Anas rubripes rubripes</i>	<i>Pisobia maculata</i>
<i>Chaulelasmus streperus</i>	<i>Pisobia minutilla</i>
<i>Mareca americana</i>	<i>Pelidna alpina pacifica</i>
<i>Nettion carolinense</i>	<i>Ereunetes pusillus</i>
<i>Spatula clypeata</i>	<i>Crocethia alba</i>
†* <i>Dafila acuta tzitzithoa</i>	<i>Totanus melanoleucus</i>
† <i>Nyroca americana</i>	<i>Totanus flavipes</i>
† <i>Aristonetta valisineria</i>	<i>Phæopus hudsonius</i>
† <i>Fulix marila nearctica</i>	<i>Squatarola squatarola cynosuræ</i>
† <i>Fulix affinis</i>	<i>Charadrius semipalmatus</i>
† <i>Perissonetta collaris</i>	<i>Charadrius melodius</i>
† <i>Glaucionetta clangula americana</i>	<i>Arenaria interpres morinella</i>
<i>Charitonetta albeola</i>	<i>Tinnunculus columbarius columbarius</i>

Pandion haliaetus carolinensis*Nuttallornis borealis borealis**Empidonax flaviventris**Euphagus carolinus**Zonotrichia leucophrys**Zonotrichia albicollis**Melospiza lincolni lincolni**Passerella iliaca iliaca**Vireosylva philadelphia**Vermivora celata celata**Vermivora peregrina**Dendroica tigrina***Dendroica caerulescens caerulescens*†*Dendroica coronata coronata**Dendroica castanea**Dendroica striata**Dendroica palmarum palmarum**Oporornis agilis**Oporornis philadelphia**Wilsonia pusilla pusilla**Anthus spinoletta rubescens**Corthylio calendula calendula**Hylocichla minima aliciae**Hylocichla ustulata swainsoni***Hylocichla guttata faxoni*

To the species in the above groups may be added the following, which had best be regarded for the present, at least, as accidental visitants, or stragglers:

*Uria lomvia lomvia**Larus marinus**Sternula albifrons antillarum**Pelecanus erythrorhynchos**Anser albifrons gambelli**Branta bernicla glaucogastra**Casmerodius albus egretta**Florida caerulea caerulea**Nycticorax nycticorax naevius**Recurvirostra americana**Limosa fedoa**Catoptrophorus semipalmatus inornatus**Rhynchodon peregrinus anatum**Xanthocephalus xanthocephalus**Helmitheros vermivorus**Dendroica pinus pinus*

There is a most interesting overlapping of the so-called faunal life-zones in this region. While one of the factors responsible for this overlapping is undoubtedly the temperature, influenced, as it is, by Lake Erie and an open western front, which allows full sweep of the winds, there is no doubt in the mind of the writer that the local boggy condition (which must be changing slowly) with its characteristic tree-growths, is very largely responsible for the presence of some nesting species. In this one small area may thus be found typical representatives of the Canadian Zone, Alleghanian Zone, and also, almost within stone's throw, forms of the Carolinian Zone. Thus Northern Water Thrushes, Wilson's Thrushes, and Tufted Titmice may be found nesting in the same wet woodland, or Wilson's Snipes, Swamp Sparrows, and Cardinals may occur side by side at the margins of the marsh.

Since the close of the Glacial Period it appears that the faunæ of the several zones have been moving northward, one after the other. Formerly Pymatuning probably had numerous forms of the Canadian Zone which are absent today; most of the typical Alleghanian forms

are now present; but even during the few years covered by our observations the Carolinian forms have become commoner. The forms of the Carolinian Zone seem to be working around through the northern central part of Pennsylvania, following the shore of Lake Erie to the north and east. The changes in Pymatuning Swamp, due to drainage, lumbering, and various forms of reclamation, have caused the more northern characteristics of the locality to partly disappear, and the avifauna of the Canadian Zone to disappear also. When once the northern forms recede it seems they do not reappear.

As the Canadian forms have receded to the northward, Alleghanian forms have become dominant, and Carolinian forms much more prominent. This does not, of course, mean that the geographical zones are changing; it means that ecological conditions (perhaps including temperature to some extent) are changing.

The typical forms of the Canadian life-zone are *Capella gallinago delicata*, *Anas rubripes tristis*, *Anas platyrhynchos platyrhynchos*, *Asio flammeus*, *Sphyrapicus varius varius*, *Junco hyemalis hyemalis*, *Dendroica fusca*, *Dendroica virens virens*, *Seiurus noveboracensis noveboracensis*, *Wilsonia canadensis*, *Certhia familiaris americana*, and *Sitta canadensis*.

Species certainly referable to the Carolinian fauna are *Centurus carolinus*, *Empidonax virescens*, *Richmondia cardinalis cardinalis*, *Stelgidopteryx serripennis serripennis*, *Icteria virens virens*, *Seiurus motacilla*, *Wilsonia citrina*, and *Beolophus bicolor*. All of these species are regularly recorded and locally abundant. Nevertheless the bird-life seems to be chiefly representative of the Alleghanian life-zone, with such characteristic forms as *Rallus virginianus*, *Porzana carolina*, *Empidonax minimus*, *Dolichonyx oryzivorus*, *Carpodacus purpureus purpureus*, *Passerculus sandwichensis savanna*, *Melospiza georgiana*, *Hedymeles ludoviciana*, *Iridoprocne bicolor*, *Dendroica pensylvanica*, and *Hylocichla fuscescens fuscescens*, abundant. While the region thus seems to have a predominance of Alleghanian forms, there is such a noticeable admixture of representatives of the other ecological associations that it is with hesitation that we pronounce the area as belonging to one zone or another. The boundaries of life-zones are, in the very nature of the case, rather indefinable. The term *life-zone* is here used only for convenience in grouping plants and animals, which usually occur together, because they respond similarly to certain factors of environment. Pymatuning Swamp is

interesting, therefore, not so much because there is this so-called overlapping of life-zones, as such, as because there are such widely differing ecological conditions closely adjacent in so small an area.

In the following list the greater number of species receive only a statement of their status (as accurate as possible with the data assembled). A few of the species encountered have not been heretofore often closely observed on their nesting-grounds, and therefore biographical notes of some length have been added.

In this paper the notes on the nesting of the Mallard Duck, Florida Gallinule, Coot, Bittern, Short-eared Owl, Alder Flycatcher, Savanna Sparrow, Henslow's Sparrow, Blue-winged Warbler, Black-throated Green Warbler, Northern Water-thrush and Short-billed Marsh-wren are believed to be the first full accounts as to these respective species contributed in Pennsylvania.

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The following list includes only the titles of such papers as deal with the fauna, flora, geology, and history of the present area, and most of them concern Pymatuning Swamp in particular rather than Conneaut Lake. It is known that numerous notes of a general nature have been published concerning Pymatuning Swamp and Conneaut Lake in newspapers and various sportsmen's journals, but in these articles the identification of birds, mammals, or plants has been so patently open to question that it is thought best to omit reference to them. The list includes a few references to published notes concerning the song, breeding-activities, etc., of birds, which occur in the present region, although the references given do not primarily relate to this locality.

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1882. SENNETT, GEORGE B., Capture of the Golden Eagle in Crawford County, Pennsylvania.—*Bull. Nuttall Ornithological Club*, VII, January, 1882, 58.

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Contains references to Passenger Pigeons on pages 7 and 191, and on page 191 lists several species of birds on the authority of Mr. Edgar Huidekoper.

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1. *Colymbus holboëllii* (Reinhardt). HOLBÆLL'S GREBE (2).

A rather rare migrant, which appears so early in the spring and leaves so late in the fall, that we are led to suspect that it winters when the water is open and feeding conditions are favorable. Mr. Kirkpatrick preserved an adult male specimen in winter plumage which was taken by a duck-hunter on February 20, 1914, along French Creek, a little below Shaw's Landing. This individual was seen for several days and was observed to capture fish four or five inches long. Mr. Welshons took a male and female specimen in full breeding dress on April 3, 1912, at Conneaut Lake, and there is, in his collection at the Hotel Iroquois, Conneaut Lake, a male in winter plumage, also taken at the Lake, but the date for this specimen has not been ascertained. One which we saw May 13, 1922, at Crystal Lake, was in handsome spring dress. It kept well out from the shore and when pursued dived twice, then rose and whirred away toward

Lake Erie. On March 15, 1926, a pupil of Mr. S. S. Dickey of Cambridge Springs found an adult Holbøll's Grebe stranded on the ice of French Creek. The exact date of this occurrence I have only recently ascertained.

2. *Colymbus auritus* Linnæus. HORNED GREBE (3).

A regular migrant, which sometimes occurs in large flocks particularly on Conneaut Lake. It appears with the first open water in spring. Mr. Langdon noted several along the open stretches of water about Pymatuning as early as March 20, 1925. These were all, apparently, in full winter plumage. Mr. Welshons saw several on March 25 and 28, 1913, at Conneaut Lake, and during that year the birds were commonly seen from April 2 to 9, on which latter date hundreds were observed. On April 9, 10, and 16, 1925, Horned Grebes were seen by Messrs. Langdon and Bergstrom at Conneaut Lake, and from then on until the middle of May were seen almost daily. From May 18 on they became rarer, although individuals were seen as late as June 6. Two were seen by us May 29 and 31, 1923, at Crystal Lake. In 1926 many were noted at Conneaut Lake until June 1.

Two males and one female collected by Mr. Welshons, on April 2, 1912, and one observed by us on April 29, 1922, were still partly in winter dress. But a male secured on May 8, 1922, at Crystal Lake, was in very beautiful spring plumage, with only one or two gray feathers. Males seen May 29 and 31, 1923, were likewise in breeding feather. Mr. Kirkpatrick secured a male in almost full plumage from a flock of five observed on April 4, 1902, at Meadville.

In the fall the Horned Grebe appears considerably later than the Pied-billed Grebe, and lingers about until the water starts to freeze. Mr. Kirkpatrick recorded one on October 29, 1917, at Conneaut Lake. A specimen in the Allegheny College Museum at Meadville is in full winter dress, and is thought by Mr. Kirkpatrick to have been taken on November 5, 1903. Mr. Keesler secured one at Conneaut Lake on November 17, 1921.

Mr. Kirkpatrick has noted extensive migratory movements of this species at Meadville. On April 1, 1884, many were found dead about the city, evidence that during the night they had struck wires and buildings. On that and the succeeding day hundreds were seen on the ponds and water-ways about Meadville, and many were captured alive.

3. ***Podilymbus podiceps podiceps*** (Linnæus). PIED-BILLED GREBE (6).

A fairly common migrant, not so numerous apparently as the preceding species and certainly not so often seen in large flocks. It doubtless occasionally nests in the locality, since it has been known to breed much farther south⁸, but we have no certain breeding records for the Pymatuning region at the present time. It does not appear so early in the spring as the Horned Grebe, nor does it, apparently, linger so late in the fall. Our earliest spring record is that of Mr. Kirkpatrick, March 30, 1903, at Meadville. In 1925 it first appeared on Conneaut Lake on April 16 according to Mr. Langdon. Thereafter it was commonly seen until May 15, though never in flocks. We took a male specimen at Crystal Lake on May 3, 1922. Although local sportsmen maintain that these "Hell-divers" remain later, and have been known to nest, we have no authentic data at hand. However it is interesting to note that immature birds were seen as early as August 6, 1924, Conneaut Lake (Sutton), and August 8, 1904, Spring Lake, Meadville (Kirkpatrick). Whether these were birds hatched locally, or were exceptionally early fall migrants it is hard to say.

The fall movement southward usually starts in latter August or early September: August 27, 1925, Crystal Lake (Sutton); September 1, 1911, ♂, Conneaut Lake (Welshons); September 20, 1908, Meadville (Kirkpatrick); and birds may be seen every day, singly or in small flocks, until mid-October. Mr. Keesler observed it in 1921, at Conneaut Lake as late as November 17.

Mr. Kirkpatrick writes me concerning the interesting and, I believe, unique capture of this species in winter: "A specimen of this grebe was brought to me alive by a small boy who caught it near the intersection of North and State Streets, this city, near Mill Run, on January 13, 1912. This record is interesting because of the fact that the mercury registered thirty-two degrees below zero Fahrenheit in the morning of that day. In fact the temperature hovered around zero from January 4 to 17. How this bird happened to be in this locality at such a time is more than I can explain."

4. ***Gavia immer immer*** (Brünnich). LOON (7).

A regular, but never abundant, migrant, usually seen singly or in pairs. It appears with the open water in spring, and has been re-

⁸As far south at least as Allegheny County, where it was recorded by Dr. D. A. Atkinson.

corded as early as March 25 and 26, 1913, Conneaut Lake (Welshons), and March 31, 1899, Meadville (Kirkpatrick). As a rule it appears in early April: April 3, 4, 7 and 9, 1913, Conneaut Lake (Welshons); April 3, 1902, Conneaut Lake, April 9, 1897, Meadville, April 16, 1900, Conneaut Marsh, (Kirkpatrick); April 1, 1922, Conneaut Lake (Ferris); April 16, 22, etc., 1925, Conneaut Lake (Langdon); and remains until early or mid-May. Occasionally it remains as late as the last of May (May 30, 1923, we saw two birds in full plumage at Lower Lake), and sometimes even throughout the summer, although it is surmised that these are non-breeding individuals. Mr. C. J. Seiple of Greenville observed such summering individuals from July 1 to August 1, 1925, at Conneaut Lake, and the same birds were observed by Mr. Langdon on August 22 and 28. Mr. Kirkpatrick observed one on June 7, 1895, at Conneaut Lake. Mr. Langdon noted one throughout July, 1926, at Conneaut Lake.

Most of the birds seen in later April and early May were in full breeding plumage. However, we recorded an individual in dull gray plumage as late as May 15, 1925, at Conneaut Lake.

In the fall it does not begin to pass through until latter October or early November: October 22, 1903, Conneaut Lake, October 22, 1916, Meadville, and November 5, 1897, Meadville, (Kirkpatrick); and it has been seen as late as November 17, 1921, Conneaut Lake (Keesler), and November 22, 1910, Conneaut Lake (Welshons). Mr. Frank D. Fair sent me an adult female in almost complete winter plumage, taken at Sharon, Mercer County, on December 19, 1925. One or two feathers of the back, and several from the flanks were remnants of the breeding dress.

5. *Gavia stellata* (Pontoppidan). RED-THROATED LOON (11).

A rare and irregular migrant less common in spring than in fall according to local gunners, and found, apparently, only at Conneaut Lake. Mr. Langdon furnishes our only definite spring records. He saw an adult in full plumage during a heavy snow-storm on April 30, 1925. On April 6, 1926, he noted a pair in full plumage, and on April 9 a single bird. These were all observed in the deeper waters of Conneaut Lake.

In the fall it appears late. An adult specimen, mounted by Mr. Kirkpatrick, was taken by a Mr. Lewis on November 29, 1909, at Conneaut Lake, and a beautiful male in the Iroquois Hotel collection

of Mr. Welshons was secured at Conneaut Lake on December 5, 1912. There is a possibility that this species occurs occasionally as a winter resident when Conneaut Lake is free from ice.

6. **Uria lomvia lomvia** (Linnæus). BRÜNNICH'S MURRE (31).

A rare straggler, for which we have but one certain record. A specimen in winter plumage which was taken at Conneaut Lake by Mr. Thomas Garren of Pittsburgh, on December 3, 1903, was brought to Mr. Kirkpatrick for mounting. This specimen was placed in Mr. Rufus C. Adams's collection at the Oakland Beach Hotel, where it is at the present time. It is unusual to find a maritime species, such as this, even on Lake Erie, and consequently even more unusual to secure one inland.

Stercorarius parasiticus (Linnæus). PARASITIC JAEGER (37).

This maritime species has been taken once at the head of Erie Bay, by Mr. Merrick Low, according to the catalogue of Mr. Sennett's collection (Todd, *Birds of Erie and Presque Isle*, 1904, 502).

Rissa tridactyla tridactyla (Linnæus). KITTIWAKE (40).

While this maritime species may, as Mr. Todd suggests, be sparingly represented on Lake Erie during the winter, and may, therefore, occasionally wander over to Conneaut Lake, there is no doubt that inland it must be looked for only as a rare and irregular straggler. Mr. W. W. Worthington recorded it positively only once at Erie (Todd, *Birds of Erie and Presque Isle*, 1904, 502).

7. **Larus marinus** Linnæus. BLACK-BACKED GULL (47).

In view of several records of this species for Buffalo, New York (Savage, *Auk*, XII, 1895, 312) and the reports of fishermen at Erie that these gulls are occasionally met with in the deep water of Lake Erie in early winter (Todd, *Birds of Erie and Presque Isle*, 1904, 502), it seems probable that individuals occasionally wander from the larger body of water across to Conneaut Lake. Mr. Welshons is the only observer who has actually recorded the species, so far as I can determine. During late winter and early spring in 1904 he repeatedly saw several Black-backed Gulls on the ice in the middle of Conneaut Lake. He states that, even at a distance, they appeared much larger than the numerous Herring Gulls. On November 4, 1926, he noted it again at Conneaut Lake.

8. *Larus argentatus argentatus* Pontoppidan. HERRING GULL (51).

A migrant, irregularly common at Pymatuning, and regular and abundant at Conneaut Lake, often appearing so early in spring and remaining so late in fall that it may fairly be regarded as a winter resident. Mr. Todd regards it as an abundant winter resident at Erie (*Birds of Erie and Presque Isle*, 1904, 503) and the proximity of the lake doubtless accounts for its winter appearance inland, as well as for many of the early spring records. In summer Herring Gulls are sometimes seen. These may be non-breeding individuals, which have wandered over from Lake Erie, or they may be breeding birds, the nearby nesting grounds of which are at present unknown.

It has been seen as early as January 21, 1924, at Meadville (Kirkpatrick). Temperature was below zero on this date. On February 12, 1925, Mr. Kirkpatrick saw and was informed of several flocks about Pymatuning, Conneaut Lake, and French Creek. It is most commonly noted in latter March and early April: March 19, 25, and 26, 1913, Conneaut Lake, (Welshons); March 3, 1904, Meadville, March 24, 1892, Bemis's Dam, three miles north of Meadville, (Kirkpatrick). At Conneaut Lake, Mr. Langdon saw them on March 11 and 20, 1925. On the latter date three adults and one immature individual were seen. From April 16 to June 6, 1925, they were irregularly common at Conneaut Lake. Many of the birds were in immature plumage, but a fair proportion were fully adult. After June 1 only an occasional gull of any kind is seen. During 1922 we saw Herring Gulls at Pymatuning only three times, May 7, 9 and 13. An immature bird remained about Crystal Lake for some time on May 9.

On May 5, 1925, Mr. Langdon secured an immature female in the first year's plumage, which was very much worn and faded, particularly on the wings and belly. The condition of this specimen was very poor, although the stomach was well filled with the remains of small fish.

In the fall the gulls reappear at Conneaut Lake in numbers during October and November. Mr. Keesler saw about twenty adult birds on November 17, 1924. Other fall dates for Conneaut Lake are: September 13, 1925 (Langdon); November 5, 1897 (Kirkpatrick).

9. **Larus delawarensis** Ord. RING-BILLED GULL (54).

A fairly regular migrant, which may occasionally remain about during the winter months, but it so resembles the Herring Gull in the field that records made at a distance are open to question.

During 1926 Mr. Langdon noted it first on April 9 at Conneaut Lake. Thereafter it was seen on April 10, May 9, 12, 13, 26 and 27. On May 9 and 12 fairly large flocks were observed. Our latest spring dates are May 29 and June 6, 1925, Conneaut Lake (Langdon).

On May 5, 1925, Mr. Langdon secured an immature female in changing plumage at Conneaut Lake. Pearl gray feathers were appearing on the back and wings, the spotted neck feathers were fast disappearing, and the much-frayed rectrices were about ready to drop out. The bird was fat, but the stomach was empty. On May 15, 1925, we observed an individual in similar plumage for several hours at the upper end of Conneaut Lake, where it sat on the high piles basking in the sun, or searched for food along the shore. A beautiful adult specimen in the collection of Mr. Edgar Huidekoper of Meadville was taken during early spring several years ago, but the exact date was not recorded. Mr. Kirkpatrick has never recorded this species.

Mr. Welshons furnishes our only fall record. He saw two adult birds at Conneaut Lake on November 12, 1911.

10. **Chroicocephalus philadelphia** (Ord). BONAPARTE'S GULL (60).

A regular and sometimes abundant transient visitant, occurring not only at Conneaut Lake, but at Crystal and Lower Lakes in Pymatuning, and along all the larger water-ways. Mr. Todd recorded it at Erie as early as April 13, 1900 (*Birds of Erie and Presque Isle*, 1904, 505). Our spring records should logically be a little earlier. Mr. Welshons recorded it at Conneaut Lake as early as March 25 and 26, 1913, and took specimens on April 3 and 4 of that year. Mr. Kirkpatrick recorded two large flocks on April 9, 1897, three miles south of Meadville, and on April 21, 1902, at Conneaut Lake. Mr. Langdon saw several at Conneaut Lake on April 9, 1926, and took a male specimen in the first winter plumage from a large flock on April 22, 1925, as well as a high-plumaged male on April 24, 1926, at Conneaut Lake. On April 29, 1922, early in the morning we saw a beautiful adult on Crystal Lake and on May 2, 1922, took an immature bird in much frayed plumage. On May 12, 1925, another ragged specimen was

taken at Conneaut Lake by Mr. Langdon. It would seem from the above notes that from the date of earliest appearance up to about May 15 most of the birds are in winter plumage, although the flock seen by Mr. Langdon on April 24, 1926, were all adults. From May 15 on, however, adult birds in full plumage are in the ascendancy. Thus adults were seen as follows: May 15, 1925, four at Conneaut Lake (Sutton); May 29, 1925, several at Conneaut Lake (Langdon); May 31 and June 1, 1924, one at Crystal Lake (Sutton); June 5 and 6, 1925, several about Conneaut Lake (Langdon). A single adult observed by Mr. Kirkpatrick near Meadville (a mile south, along French Creek) on July 31, 1910, was probably a non-breeding individual. Mr. Langdon noted several during June and July, 1926, as late as July 17.

It would seem from the data at hand that the prenuptial moult is completed earlier in the season in full adults than it is in younger birds, which are just entering upon their first breeding plumage. These younger birds were usually observed together, in groups separate from the adults. A flock of moulting immature birds seen on May 22, 1925 (from which a specimen was secured), if representative at all of the average state of moulting, could not possibly have so quickly changed into the perfect adult plumage, such as was seen but three days later, a separate flock of four adults in perfect plumage, so far as could be determined through good binoculars. This probably means that the fully adult birds reach and occupy their old nesting grounds before the younger birds appear, and the adults may either accept or reject the newcomers at their colonies as they desire.

Mr. Kirkpatrick has so often observed these gulls moving northward in spring over Conneaut Marsh to the outlet of Conneaut Lake that he quite properly infers that this is an established path of their migration.

Bonaparte's Gull is apparently much oftener recorded in spring than in fall. Mr. C. J. Seiple saw a flock of young birds on August 24, 1925, and a flock of adults on August 30, 1925, at Conneaut Lake. Mr. Kirkpatrick recorded it in the vicinity of Meadville on September 3, 1910, and on October 18, 1903.

There are specimens in Mr. Edgar Huidekoper's Meadville collection, and in the Rufus C. Adams collection at Oakland Beach Hotel, for which no data exist.

11. **Hydroprogne caspia imperator** (Coues). CASPIAN TERN (64).

A rare, but perhaps regular migrant, for which we have but one authentic record. A beautiful adult male was taken by Mr. Langdon at Conneaut Lake, on May 5, 1925. This individual was the only one seen by Mr. Langdon. It was in splendid condition, very fat, and the testes were somewhat swollen. The stomach held remains of six small fish, and one sunfish which had been, before digestion, about seven inches long. Mr. T. Walter Weiseman of Emsworth, Pennsylvania, found this species nesting near Erie in 1924, although Mr. Todd regarded it only as a transient visitant there (*Birds of Erie and Presque Isle*, 1904, 506); therefore the species may be expected occasionally during the summer or early fall, when it wanders across from the larger body of water.

Sterna forsteri Nuttall. FORSTER'S TERN (69).

This species, known to be more commonly a bird of the interior than *Sterna hirundo*, should occasionally occur at Conneaut Lake during migrations. The St. Clair Flats appear to be the nearest locality on the Great Lakes where it is known to occur (Cook, *Birds of Michigan*, 1893, 29).

12. **Sterna hirundo** Linnæus. COMMON TERN (70).

A fairly common and regular migrant, most frequent at Conneaut Lake; occasionally noted in mid-summer. Mr. Welshons secured an adult male at Conneaut Lake on April 4, 1912. Mr. Langdon recorded the first individuals in 1925 on May 4. They were fairly common for several days thereafter. From May 13 to 18, 1926, they were abundant at Conneaut Lake, according to several observers. On May 14, 1925, we saw one at Conneaut Lake. As late as June 6 a few individuals were seen. Mr. Kirkpatrick took adult specimens on May 16 and on May 19, 1899, at Conneaut Lake. We saw one at Crystal Lake on June 1, 1924. During June and July, 1926 Mr. Langdon noted it occasionally at Conneaut Lake, but he thinks it was not nesting. During the week of July 8-15, 1927, Mr. Seiple noted two at Conneaut Lake.

The fall movement is difficult to recognize due to the wandering of individuals which may be nesting along the southern shores of Lake Erie. One seen by Mr. Earl L. Poole of Reading, Pennsylvania, on August 6, 1924, near the Hotel Conneaut, was probably a summer wanderer rather than a migrant. An immature bird observed for

some time on September 18, 1925, at Crystal Lake, was probably moving southward, although in departing it flew not to the south but toward Conneaut Lake. Mr. Welshons took an adult female on September 12, 1912, at Conneaut Lake.

13. *Sternula albifrons antillarum* (Lesson). LEAST TERN (74).

A rare, probably accidental migrant, for which we have but one record. Although it has long been known to nest in as far northerly a latitude, it is usually a bird of the sea-coast. Its occurrence in the Conneaut Lake region likely indicates an attempt to establish a nesting colony on Lake Erie, unless it is due merely to wandering or to storms.

Mr. Welshons secured a male specimen at Conneaut Lake on April 10, 1912.

The late Mr. D. Arthur Gill of Meadville described a tern which he saw at Conneaut Lake on May 28, 1906, to Mr. Kirkpatrick, who identified the bird provisionally as a Least Tern. It would be easy for the amateur student to confuse the Black Tern in immature plumage with the present species.

14. *Chlidonias nigra surinamensis* (Gmelin). BLACK TERN (77).

A fairly regular and sometimes abundant transient visitant, not only at Conneaut Lake, where it has been most commonly observed, but about all the smaller bodies of water in the vicinity; known to have formerly nested in the region.

On April 10, 1912 Mr. Welshons took a male specimen, and on May 12, 1925, Mr. Langdon saw a large flock at Conneaut Lake. On May 15, 1922, we saw about fifty at Crystal Lake. The silent birds swung about fearlessly, hovering just over our heads and circling near the shore in search of food. On May 15, 1925, at Conneaut Lake we saw but one bird, an adult in breeding plumage; it was perched on a piece of floating driftwood and allowed very close approach. Mr. Langdon saw the birds thereafter several times, as late as June 6. Mr. Kirkpatrick saw one near Meadville flying southward along French Creek on June 5, 1911.

During 1926 Mr. Langdon saw several Black Terns frequently throughout June and July and he was led to believe they were breeding. Mr. Welshons is the only observer, however, who has actually found a nest. He found two nests during the summer of a former year

(about 1910). The chances are that this species will again breed in the region if protection is given it, and if all the possible nesting-sites are not destroyed. The nearest point at which they are known to breed regularly appears to be Sandusky, Ohio (Todd, *Birds of Erie and Presque Isle*, 1904, 507).

In fall the migration movement starts early. Mr. William A. Jackson observed a flock as early as August 10, 1925, at Conneaut Lake. Mr. Welshons took a female at the same point as late as November 12, 1912.

15. **Phalacrocorax auritus auritus** (Lesson). DOUBLE-CRESTED CORMORANT (120).

A rare and irregular transient visitant which has been recorded only at Conneaut Lake. Our earliest dates of spring arrival are in mid-April: April 15, 18 and 30, 1926, Conneaut Lake (Langdon). One was seen by the same observer on May 5, 1925, and pursued for some time. It was seen daily until May 11. On May 15, 1925, I saw a beautifully plumed adult, which may have been the individual seen previously, and watched it for half an hour at close range. Mr. Langdon observed a Cormorant from May 3 to 18, 1926, at Conneaut Lake. Mr. Welshons's record of a male taken May 30, 1913, seems to be our latest for the spring; he saw one at the lake on August 26, 1926.

Fall records are apparently more numerous. Mr. Max Keck secured one on October 16, 1909. The late Dr. Douglas Stewart of Pittsburgh saw a pair on October 18, 19 and 20, 1891, and secured one. Mr. Charles W. Lane, formerly of Meadville, secured one on November 2, 1884. This specimen was mounted by Mr. Kirkpatrick, and is now in the Rufus C. Adams collection at the Oakland Beach Hotel.

Phalacrocorax auritus floridanus (Audubon). FLORIDA CORMORANT (120a).

According to Mr. Todd (*Birds of Erie and Presque Isle*, 1904, 509) and Dr. Langdon (*Journal Cincinnati Society of Natural History*, III, 1880, 229) this form formerly may have bred as far north as Erie. Perhaps the adult individual noted by Mr. Bergstrom at Conneaut Lake on August 26, 1926, was of this form.

16. **Pelecanus erythrorhynchos** Gmelin. WHITE PELICAN (125).

A rare straggler which has been recorded only a few times in the region. Mr. E. W. McGill of Meadville tells me that a specimen was taken in May, 1905, at Pymatuning, by a man whose name is not remembered. Since it would seem impossible for even the most un-

informed person to misidentify this species, I am led to give credence to this record. Mr. John Porter of Meadville shot one at Conneaut Lake on October 1, 1861. This specimen was mounted by Mr. Kirkpatrick. The late Dr. Douglas Stewart of Pittsburgh, and Mr. William Foust of Conneaut Lake each took an adult at Conneaut Lake on October 15, 1898. These well preserved specimens are in the collection of the Carnegie Museum. It is said that three Pelicans were seen at the Lake at the time of the taking of these specimens. Mr. Welshons took a specimen several years ago, but unfortunately the date was not recorded.

17. ***Mergus merganser americanus*** Cassin. MERGANSER (129).

A fairly common migrant, appearing early in spring, remaining late in fall, and doubtless occurring irregularly in winter, when there is suitable open water. Our only winter record is furnished by Mr. Kirkpatrick, who came upon a flock of twenty of these birds feeding in an open stretch of water, at Kennedy's Riffles, along French Creek south of Meadville, on January 5, 1882. Concerning their actions Mr. Kirkpatrick writes as follows:

"When one of their number caught a fish the others tried to get it, and in their endeavor to do so would shoot over the surface of the water with great speed and much splashing. Both the wings and feet were used in propelling themselves forward. After they tired of fishing they crawled out on the ice that lined the shore. Some dressed their plumage; others laid their heads and necks on their backs as though sleeping, and some acted as sentinels on lookout for danger. While fishing they worked against the current."

Local gunners regard this species as much more common in the spring than in the fall, and our own records tend to confirm this opinion. Mr. Kirkpatrick has recorded it several times in early March: March 2, 1892, and March 2 and 4, 1897 (French Creek, just south of Meadville). Apparently it is seen most commonly from the middle of March, on: March 20, 1925, Lower Lake (Langdon); March 24, 1892, and March 28, 1900, French Creek, near Meadville (Kirkpatrick); March 25, 1912, Conneaut Lake (Welshons). Mr. Bergstrom saw several at Conneaut Lake and Pymatuning on March 30, 1925. A female specimen taken by Mr. Kirkpatrick on March 24, 1892, had its throat distended by a fish over seven inches long. Mr. Langdon noted a flock on April 9, 1926.

Although the Goosander is known to occur in the fall, we have but one actual record, that of a male killed by Mr. Theodore Kiskadden of Hartstown on Lower Lake, November 20, 1924.

18. **Mergus serrator** Linnæus. RED-BREASTED MERGANSER (130).

A fairly common and regular migrant, noted particularly at Conneaut Lake, where many are taken each season by the hunters. Residents of the region regard it as much commoner in spring than in fall. Our records tend to show that it arrives later in spring than the American Merganser and there is no indication that it ever remains through the winter. Apparently it arrives during the last week in March: March 20, 1925, Lower Lake (Langdon); March 26, 28 and 29, 1913, Conneaut Lake (Welshons). Two were taken at Lower Lake on April 3, 1911, by the late Mr. E. E. Hunter of Hartstown. Mr. Kirkpatrick's earliest records are all in April: April 3, 1899; April 3, 1910; April 8, 1883; April 18, 1899 (neighborhood of Meadville, along French Creek). In 1911 Mr. Welshons recorded the first arrival at Conneaut Lake on April 5. In 1926 Mr. Langdon did not record it until April 9. On all but the last of the above cited dates specimens were taken, chiefly by Mr. Welshons. Most of these birds were in high plumage. Mr. Frank Choffel secured a handsome male on April 25, 1901, which is at present in the collection of the Carnegie Museum.

Mr. Langdon noted two pairs of Red-breasted Mergansers several times from June 1 to 15, 1926, at Conneaut Lake. These records are so late for migration that we are led to believe that this species may nest in the region. Mr. Samuel E. Bacon so frequently recorded it in mid-summer at Erie, that he was led to believe that they nested there occasionally (Todd, *Birds of Erie and Presque Isle*, 1904, 510-511).

Our data for the fall migration are not so complete as those for spring. On November 20, 1911, Mr. Welshons collected one male and two females at Conneaut Lake. Numbers of specimens have been taken in the fall, but no dates were kept. It is presumable that the present species leaves for the south somewhat earlier than the American Merganser.

19. **Lophodytes cucullatus** (Linnæus). HOODED MERGANSER (131).

A fairly common migrant, both in spring and fall, and regarded by Mr. Kirkpatrick as commoner in the Meadville region than the two

preceding species. From the data at hand I believe it may be said that the present species is the only merganser which is equally numerous in spring and fall. Mr. Kirkpatrick's record for February 21, 1897 (French Creek), must be regarded as exceptionally early, and in view of his records for December 14, 1897, and December 16, 1912, would lead us to suspect that this species sometimes remains through the winter. Our spring records are scattered through March, April, and May: March 8, 1899, March 17, 1901, March 23, 1908, and April 1, 1895, French Creek, Meadville (Kirkpatrick); April 3 and 5, 1912, April 5, 1913, April 11, 1911, Conneaut Lake (Welshons); March 20 and April 16, 1925, Conneaut Lake (Langdon). It remains until late May: May 2, 1926, Conneaut Lake (Langdon); May 20, 1922, Lower Lake (Sutton); and may nest, although none of the local observers believes that it does. Some parts of Pymatuning are so admirably suited to the nesting of this species that I believe we may reasonably expect it to be recorded as a breeding bird. Mr. Langdon noted a pair on the extremely late date of June 17, 1926, at Conneaut Lake.

In the fall it appears in October and is seen commonly in November: November 6, 1911, Conneaut Lake (Welshons); November 18, 1925, November 21, 1924, and November 24, 1922, Conneaut Lake (Kessler); November 28, 1883, French Creek (Kirkpatrick).

Mr. Kirkpatrick usually observes this species along French Creek in flocks of eight or ten individuals.

20. *Anas platyrhynchos platyrhynchos* Linnæus. MALLARD (132).

An abundant migrant, equally common in spring and fall, an occasional winter resident, and rather common summer resident, which has been known to nest in Pymatuning, at Conneaut Marsh, and at local ponds north of Geneva Township. Both Mr. Langdon and Mr. Bergstrom have known it to winter customarily, though always in small numbers, in the sheltered open stretches of water about Pymatuning. With the Mallards these observers have found also Red-legged Black Ducks and Pintails. We have no definite winter dates at the present time, though Mr. Langdon informs me that the birds were seen in January and February, 1925, and Mr. Kirkpatrick has seen them on December 17, 1900, and December 31, 1896, near Meadville. A flock seen at Pymatuning on March 11, 1925 (Langdon and Bergstrom), may have been wintering individuals, although the date probably marks the first of the northward movement. Other early

spring dates are as follows: March 15, 1912, and March 28, 1913, Conneaut Lake (Welshons); March 6, 1901, March 12, 1898, and March 24, 1900, Meadville (Kirkpatrick). From April 10 onward the species is common, and we have numerous migration records as late as early, or mid May. On April 18, 1926, Mr. Frank Smock, who lives near Shaw's Landing, saw about five thousand Mallards in one flock. He says that he never knew wildfowl to be so abundant.

On May 7, 1922, mated pairs were seen at all suitable bodies of water, and, although most of these were only transient visitants, some of them doubtless remained to nest. The four mated pairs observed on May 20 were likely locally breeding birds. Mr. Langdon noted mated birds throughout June and July, 1926.

That the Mallard regularly nests in the region is now fully established. Mr. Kirkpatrick was aware that it nested at Conneaut Marsh about thirty years ago; and Mr. W. A. Ellis, who lives near Hartstown saw females with young during June in 1918 and 1920. Our first positive nesting record was furnished on May 7, 1922, however, when I saw several beautiful Mallard drakes and ducks which had been hatched by Mr. B. K. Baker, of Hartstown, from eggs found in a nest three miles north of Hartstown, during early May, 1921. These birds were sleek and agile, and ever so much more graceful than domestic fowls. The captive birds were mated and on May 13 several of the females were incubating full sets of eggs. They built their nests under wood-piles, in rolls of wire and in other sheltered situations about the farmyard. All the birds had one wing clipped.

In early July, 1924, Mr. W. B. Adsit saw a female and five young which had been hatched on his farm north of Geneva Township. The same pair of adults, presumably, were nesting there in 1925, and we watched the guardian male for some time, hoping that he would disclose the whereabouts of the nest. He frequented only one or two ponds and puddles, and refused to leave the vicinity, though he was considerably chased. On May 22, 1922, while I was climbing to a Red-headed Woodpecker's nest, a female Mallard flew past me directly under the dead tree. I watched her until she disappeared among the alders of the wild swamp north of Hartstown. Though we did not find the nest, she and her nine young were seen on several dates during June and July. On May 17, 1925, a pair, which must have been preparing to nest, were seen at Meadville Junction Pond. Individual birds were seen in latter August, 1925, at Pymatuning; and north of

the corduroy-road in sheltered pools were found quantities of feathers indicative of the moult which had taken place. No individuals in eclipse plumage have been found, so far as I know. On August 25, 1925, we saw a family of Mallards swimming about the shore of Lower Lake. The mother and eight well-developed young were seen to good advantage. On June 30, 1927, three broods of young birds were seen with their mothers, four miles north of Hartstown. At the same place about twelve adult birds were noted flying from pond to pond along the channel of the Shenango River. These birds were often flushed from the thick grass, where they apparently were eating the abundant duck-weed. They quacked considerably, even when they were not disturbed.

The fall migration appears to start in early or mid October. A large flock seen by Mr. Langdon on September 14, 1925, were, I believe, locally hatched individuals. The exact status of birds seen at Crystal Lake on October 1, 1925, by Messrs. Langdon and Bergstrom, is difficult to determine, but the records of Messrs. Welshons, Kirkpatrick, Keesler, and others show that by mid October the transient birds are present in large numbers: October 20, 1894, Meadville (Kirkpatrick). Mr. Welshons has taken several specimens in the latter part of November (Conneaut Lake November 20, 1922); and Mr. Keesler found them common on Conneaut Lake throughout November in 1923. Mr. Kirkpatrick's records for December (cited above) probably mark the last of the fall movement southward.

21. *Anas rubripes rubripes* Brewster.

RED-LEGGED BLACK DUCK (133).

It is probable that this northern variety of the well known Black Duck is much commoner than our records actually show. It comes southward with the Mallards in October and November, and then either spends the winter in local pools, when the water is open and food is abundant, or passes southward for a month or two, to return with the first open water of spring. It is likely that all individuals wintering at Pymatuning (such as were seen by Messrs. Bergstrom and Langdon on February 18, 1925) are of this form, and certain it is that the feet, wings, and heads of three specimens taken by Mr. E. E. Hunter on Lower Lake on December 26, 1922 (forwarded for identification) belonged to this race. Mr. Kirkpatrick examined two Black Ducks of this race taken near Meadville on December 25 of a former

year. He states that these were the largest and handsomest Black Ducks he ever saw. The water-ways of Pymatuning, including the Shenango River, are often open throughout even severe cold spells, and here the ducks remain. The lakes, of course, usually freeze over. On November 10, 1926, Mr. Welshons collected a handsomely marked male at Conneaut Lake.

22. *Anas rubripes tristis* Brewster. BLACK DUCK (I33a).

Since two forms of the Black Duck unquestionably occur here (often simultaneously) there must always be some question about field-records, where no specimens are taken. It is to be regretted that very few Black Ducks have been saved, in spite of the numbers that annually are killed on Conneaut Lake. It is reasonable to assume, however, that this is the form which nests locally, and it is certain that the birds secured by Mr. Welshons during the latter part of March, 1913, were of this subspecies.

The Black Duck rarely nests at Pymatuning. Mr. W. A. Ellis found a nest with twelve eggs in May, 1919, on his farm near Hartstown. Mated pairs were seen by us near Hartstown on May 30, 1923, and a female was flushed from dense brush where it is thought she had nest or young, on May 31. This bird was seen at close range and was undoubtedly *tristis*. On July 4, 1924, Dr. Hugo Kahl of Pittsburgh saw an immature duck at Conneaut Lake, which he thinks was of this species. On September 4, 1925, near Shaw's Landing we found a female bird and seven young, all of which were apparently unable to fly, but none of which we could catch, due to the great difficulty of getting across a deep channel and wading through tangled brush, weeds, and high cat-tails. Unfortunately none of this family was taken as a specimen. On June 30, 1927, two Black Ducks were seen four miles north of Hartstown, and a female with nine half-grown young was observed to good advantage along the channel of the Shenango River. On July 1 and 2, 1927, Black Ducks were observed not far from Espyville.

Black Ducks (whether of this variety or the preceding) are common from late in March (March 24, 1900, Kirkpatrick, Meadville) until May (May 5, 1925, Langdon, Conneaut Lake). In fall the species is apparently not common until late October and November: October 1, 1925, Lower Lake (Bergstrom); November 5, 1910, Conneaut Lake (Welshons); November 19, 1903, Meadville (Kirkpatrick). Mr. Kirk-

patrick believes that four birds seen on December 9, 1895 (one secured), along an old channel of French Creek, were of this subspecies.

23. **Chaulelasmus streperus** (Linnæus). GADWALL (135).

At Erie, Mr. Todd found this species very rare (*Birds of Erie and Presque Isle*, 1904, 514) in spite of Warren's earlier statement to the contrary (*Birds of Pennsylvania*, 1890, 37). We regard it as one of the rarest members of its family at both Pymatuning and Conneaut Lake. Mr. Langdon noted a small flock on May 8, 12, and 13, 1926, at Conneaut Lake; probably the same birds were recorded on all these dates. Four Gadwalls were seen on May 14 and 15, 1925 at Conneaut Lake by Messrs. Langdon, Bergstrom, and myself. There were two males and two females, and they were seen at fairly close range in excellent light. Their feet were noticeably yellow as they took flight.

Mr. Welshons took an adult female at Conneaut Lake on October 1, 1926. Two males were taken at the same point by Mr. William Jackson on October 18, 1926. During 1926 Mr. Welshons took a female on October 1 and a male on November 3 at the Lake.

Mareca penelope (Linnæus). EUROPEAN WIDGEON (136).

While we have been unable to locate specimens upon which to base the inclusion of this species in our list, it appears that there are several reports of the taking of European Widgeons at Conneaut Lake. In view of the numerous records from nearby points it is strange that no specimen from the present region has been saved, and the addition of the species to this list is surely only a matter of time. Mr. Todd, however, did not record it at Erie (*Birds of Erie and Presque Isle*, 1904, 515).

24. **Mareca americana** (Gmelin). BALDPATE (137).

A rather uncommon migrant, which probably occurs in about equal numbers in spring and fall, although we have but few autumnal records at present. Apparently it arrives in mid-March: March 18, 1913, Conneaut Lake (Welshons); March 20, 1925, Lower Lake (Langdon). It remains until early or mid May: April 9, 1926, Conneaut Lake (Langdon); May 2, 1910, Conneaut Lake (Welshons); May 7, 1926, Conneaut Lake (Langdon); May 14 and 15, 1925, Conneaut Lake (Sutton). Mr. Welshons has taken specimens at Conneaut Lake as follows: March 24, 1913, male; March 29, 1913, male; May 2, 1910, male and female. Mr. Kirkpatrick took a male along Conneaut Out-

let near its junction with French Creek, on April 1, 1907, and on April 10, 1884 secured a specimen from a large flock which was seen at Conneaut Marsh.

Mr. Bergstrom noted it first in the fall of 1926 on October 18, on which date several small flocks were noted at Conneaut Lake, and one male was taken. A pair were taken by Mr. Bergstrom at the Lake on October 20, 1926. Mr. Welshons took a male and female at Conneaut Lake on October 28, 1926.

25. *Nettion carolinense* (Gmelin). GREEN-WINGED TEAL (139).

A fairly regular migrant, regarded as common by local gunners. Our actual records are so few that they do not very accurately indicate the movements of the species. Mr. Kirkpatrick has taken it as early in the spring as March 25, 1895, at Meadville along French Creek. It was seen in latter April and early May, 1922, at Lower Lake by Mr. E. E. Hunter of Hartstown. Mr. Langdon noted it as abundant from April 11 to 21, 1926, at Conneaut Lake. Our latest spring date, May 17, 1925, Crystal Lake (Hunter), probably marks the last of the spring migration.

In fall it has been noted early in September, as I am informed by several local sportsmen, but we have no definite record before October 1, 1925, Conneaut Lake (Bergstrom). On October 1, 1926, Mr. Bergstrom noted several about the smaller ponds at Pymatuning Swamp. He examined several specimens, which had been taken by the gunners. From October 1 to 20, 1926, they were seen daily, but were not numerous. Mr. Keesler shot specimens at Conneaut Lake on November 7 and 15, 1924, and November 13 (female), and 18 (male), 1925; and Mr. Welshons secured a male and female at the Lake on November 21 of the same year. Mr. Bergstrom's latest fall dates are: November 10, 1925, one seen in a ditch on the Huidekoper Farm near Conneaut Lake; and November 14, 1925, one seen on Conneaut Lake.

26. *Querquedula discors* (Linnæus). BLUE-WINGED TEAL (140).

A common migrant both in spring and fall, which probably nests, since it has been known to breed about a hundred miles to the southward in the Panhandle of West Virginia (Sutton, *Oölogist*, Vol. XXXVII, 1920, 55), and since it is occasionally noted in mid-summer in the present region. In the spring it arrives as early as mid March: March 20, 1912, female collected, Conneaut Lake (Welshons); March

15, 1925, Lower Lake (Langdon); March 30, 1926, Linesville (Sutton). However, most of the spring records center about the first week in April, and continue until the end of the month: April 27, 1905, Meadville (Kirkpatrick); April 29, 1925, Lower Lake (Langdon); May 4, 1924, Crystal Lake (Sutton). On April 18, 1926, Mr. Langdon noted a flock of about one thousand at Conneaut Lake. Numerous spring specimens have been taken, including a male and female secured on April 6, 1912; a male taken April 8, 1912; two males and a female secured on April 3, 1913; and four males taken April 7, 1913, at Conneaut Lake by Mr. Welshons. Mr. Langdon noted it at Conneaut Lake as late as July 10, 1926. On July 2, 1927, we observed a female along the Shenango River, not far from Espyville.

In the fall the species moves southward early. Three young birds were seen by several observers, including Mr. John Shadely and his son, at Conneaut Marsh, on August 28, 1925. It was thought at the time that these birds had been reared locally. Mr. Kirkpatrick secured a specimen along the old channel of French Creek, near Meadville, on September 24, 1887, and Mr. Bergstrom recorded one at Pymatuning on October 1, 1925. This species is apparently as common at the small lakes and minor water-ways as it is at Conneaut Lake. Mr. Bergstrom last noted it in 1926, on October 18. During September and early October of that year he noted it occasionally, but found it decidedly uncommon.

27. *Spatula clypeata* (Linnæus). SHOVELLER (142).

A rather rare transient visitant apparently present in about equal numbers in spring and fall; may have formerly nested in the district. It sometimes arrives as early as mid March. On March 15, 1912, Mr. Welshons collected a female at Conneaut Lake. Most of our spring records fall in latter March or in April; March 28, 1913, two females collected Conneaut Lake (Welshons); April 9, 1911, male collected, Conneaut Lake (Welshons); April 9 and 10, 1925, flock of six seen, Conneaut Lake (Langdon); April 12, 1880, male collected by Mr. Kirkpatrick at a small swamp about two miles south of Meadville. Our records tend to show that the Shoveller rarely remains after mid April, although Mr. Langdon noted it on April 29 and 30, 1926, at Conneaut Lake.

In the fall it does not appear as a rule before October. On October 12, 1919, Mr. Kirkpatrick saw a flock of twelve feeding in a swamp

about two miles south of Meadville. One of these was taken. On November 1, 1924, Mr. Bergstrom examined a handsome male taken by Mr. Charles Shakespeare at Lower Lake. On November 10, 1917, Mr. Kirkpatrick took one near Meadville. Mr. Keesler secured a female on November 24, 1922, at Conneaut Lake, and our latest autumnal record is that of a male taken December 1, 1917, by Mr. Kirkpatrick along French Creek.

28. *Dafila acuta tzitzihoa* (Vieillot). PINTAIL (143).

Common as a spring and fall migrant, and rather uncommon and irregular as a winter resident. Both Mr. Bergstrom and Mr. Langdon have repeatedly seen Pintails during December, January, and February, though never in large numbers. Usually they were associated with the wintering Black Ducks and Mallards. Mr. Kirkpatrick's Meadville record for March 6, 1897, probably marks the first of the northward migration, however, and we have several records for the following weeks: March 11 and 15, 1925, Conneaut Lake (Langdon). On March 20, 1925, Mr. Langdon saw tremendous flocks everywhere about Pymatuning and Conneaut Lake. Pintails may remain as late as early May, though not, perhaps, characteristically. We saw the remains of a male which had been found dead at Lower Lake on June 1, 1924. Regarding the spring migration in former years Mr. Kirkpatrick writes:

"Some prolonged flights of this species were noted in early March back in the late eighties along the French Creek Valley in the Meadville region."

In the fall it comes south a little later than the teal, although a single male was observed and taken by Mr. Welshons as early as September 3, 1912, at Conneaut Lake. Mr. Kirkpatrick has several November records for the Meadville region and Conneaut Marsh: November 10, 1917; November 19, 1903; November 23, 1906; and one in December: December 1, 1917. Birds which remain after December 1 are likely to be winter residents.

29. *Aix sponsa* (Linnæus). WOOD DUCK (144).

Common, and sometimes during recent years, abundant as a migrant, and locally a regular and common summer resident. It arrives somewhat later than the Mallard, Pintail, and Black Duck, our earliest records being: March 28, 1913, two seen, Conneaut Lake

(Welshons); March 30, 1912, male collected, Conneaut Outlet (Welshons); March 30, 1908, French Creek (Kirkpatrick). We have numerous records throughout April. From April 10 onward most of the birds seen are probably summer residents, although it is impossible to distinguish these from the lingering transients. On April 28, 1925, Mr. Langdon saw a mated pair along French Creek, and a pair observed by us on May 30, 1923, at Lower Lake, were doubtless nesting. A female shot on June 1, 1924, was evidently incubating, and it is thought that her nest was two miles north of Hartstown in one of the branchless dead stubs toward which she had several times been seen flying.

During the week prior to May 14, 1925, the town of Conneaut Lake was amused by stories of a duck which persistently entered a chimney, caused much commotion, and was finally captured and liberated. This was a female Wood Duck evidently searching for a nesting site.

Mr. W. W. Andrews of Pittsburgh, who has spent much time in the Pymatuning region, has found numerous nests along the southern border of the Swamp and at Conneaut Marsh north of Custards. He often found the nests in the very tops of the dead stubs, sometimes in a more or less exposed situation. Mr. Edgar Huidekoper knows of at least three nests, one of which was built in a huge sycamore not far from Shaw's Landing. Late in July, 1925, a farmer saw a female and her numerous young crossing a dusty road near Shaw's Landing. On August 7, 1926, Mr. Welshons saw a pair and six young at Conneaut Lake. On August 27, 1925, we noted a parent and several nearly full-grown young at Wightman Pond. On August 26, 1925, a male emerging from the eclipse plumage was seen at Conneaut Marsh. A female secured on September 4, 1925, at Conneaut Marsh had not yet completed the post-nuptial moult, although she could fly perfectly.

In the fall the locally-reared young congregate, seemingly by themselves, and the single males and females, or small groups of the adults, wander about aimlessly, resting on the ponds or walking along the banks. On October 1, 1925, Mr. Langdon saw at least a hundred young birds in one pond near Shaw's Landing, where each evening the family flocks came in to rest, and probably to spend the night. We have dates throughout September and October, though it is of course impossible to distinguish local from transient birds. Our latest fall date, November 28, 1906, is furnished by Mr. Kirkpatrick (French Creek, two miles south of Meadville).

On July 1, 1927, we found a pair of Wood Ducks and their young along the Shenango River not far from Espyville. The male bird flew away briskly; later the female rose and flew off. The young birds which attempted to follow did not rise from the water, however, but turned with amazing agility, disappeared among the bushes and weeds at our very feet, and could not be found though we searched diligently. They apparently swam under water for a short distance.

30. *Nyroca americana* (Eyton). REDHEAD (146).

A migrant, apparently commoner in spring than in fall, and occasionally abundant; recorded principally at Conneaut Lake. In the spring it appears early, having been seen by Mr. Langdon at Conneaut Lake on March 15, 1925, and by Mr. Kirkpatrick at Meadville on March 19, 1904. Mr. Welshons took a specimen at the Lake on March 17, 1913. On March 20, 1925, large flocks were seen at Conneaut Lake, and Mr. Bergstrom states that by March 30 they were abundant everywhere. All local observers have recorded Redheads during early April, and specimens were taken by Mr. Welshons on April 3, 1913, and by Mr. Kirkpatrick on April 1, 1888, and April 5, 1906. In 1926 Redheads were the predominant species at Conneaut Lake on April 8, according to Mr. Langdon. A few birds were seen by Messrs. Langdon and Bergstrom at Conneaut Lake on April 24, 1925. Mr. Langdon noted one on May 28, 1926. This date is unusually late; perhaps the bird observed was a cripple.

In the fall it returns in early October: October 3, 1909, male and female taken, Conneaut Lake (Welshons), and remains at least until mid November and probably later: November 2, 1926, male taken, Conneaut Lake (Welshons); November 10, 1883, French Creek (Kirkpatrick); November 17, 1924, male taken, Conneaut Lake (Keesler); November 24, 1925, male taken, Conneaut Lake (Bergstrom). The similarity of the Redhead and Canvasback makes it inadvisable to depend upon all ocular identifications in the field. Possibly some of the records of the Canvasback, which fall on earlier or later dates, should include the Redhead also.

31. *Aristonetta valisineria* (Wilson). CANVASBACK (147).

A fairly common migrant, sometimes very abundant, although Mr. Todd regarded it as comparatively uncommon at Erie (*Birds of Erie and Presque Isle*, 1904, 518). It is nearly always commoner than the

Redhead, and arrives, like that species, in mid March, specimens having been taken by Mr. Welshons at Conneaut Lake on March 17, 1912 (female), and March 17, 1913 (male). Mr. Bergstrom did not record it in 1925 until March 30, on which date he saw flocks of a thousand or more at Conneaut Lake. From this date on they were seen daily, and were present in multitudes until April 9 and 10. Thereafter the flocks diminished, although a few lingered about as late as May 29 (Langdon), and June 5 and 6 (Langdon and Bergstrom). The last date is unusual, and it may be that the few birds seen were non-breeding individuals. Mr. Kirkpatrick took one from a mixed flock of twenty-five Canvasbacks and Redheads along French Creek south of Meadville, on April 1, 1888. It is rather unusual to find this species along the smaller water-ways.

Our actual records for the fall are few, but it is well known that the species is quite common at Conneaut Lake almost up to the time of the freezing of the deepest waters. Thousands are often observed in the fall. On November 29, 1924, Mr. Keesler took three male specimens. On November 5 and 16, 1926, Mr. Welshons took females at the Lake.

32. *Fulix marila nearctica* (Stejneger). SCAUP DUCK (148).

A regular and sometimes abundant migrant, particularly at Conneaut Lake. The Scaup and Lesser Scaup are virtually impossible to distinguish in the field; therefore our records based on identification by sight must be open to some question, although comparison of records based upon specimens shows that there is no great difference in the movements of the two species. Scaups, whether of this species, or the succeeding, appear early in spring, our first unquestionable records for the present form being March 17 and 28, 1913, females collected, Conneaut Lake (Welshons). Mr. Kirkpatrick took a male on March 31, 1899, at Meadville, along French Creek. Mr. Langdon recorded Bluebills at Conneaut Lake as early as March 11, 1925, although the exact species is not known. Mr. Bergstrom saw large flocks on March 30, 1925. Specimens in Mr. Welshons's Conneaut Lake collection were taken throughout early April, the latest on April 20, 1910 (two males). During 1925 Scaups were seen at Conneaut Lake as late as April 30 (Bergstrom) and June 6 (Langdon), and during 1926 Mr. Langdon noted a few as late as May 17. The late birds may have been non-breeding individuals. We took a male and female specimen at Crystal Lake on May 1, 1922.

In fall Scaups are fairly abundant from October until early December. Our only positive records for the present species are based upon specimens taken at Conneaut Lake by Mr. Kessler, November 10 (male), and 11 (female), 1925, and November 22, 1922; and a male taken December 9, 1911, by Mr. Kirkpatrick along French Creek near Meadville.

33. *Fulix affinis* (Eyton). LESSER SCAUP DUCK (149).

A regular migrant, often more abundant than the Scaup. Apparently this species does not arrive quite so early as its larger relative, although Mr. Welshons took two males at Conneaut Lake on March 17, 1912, and saw numerous others from then on to March 20. During the same year he took a male and female on March 20 and 29 respectively, and on April 7 saw thousands at Conneaut Lake, many of which were doubtless Scaups. Mr. Kirkpatrick's specimens were all taken in April or later: April 2, 1909, and April 13, 1901, French Creek; April 16, 1900, Conneaut Marsh; and our own specimens were taken April 29, 1922, female, and May 10, 1922, female, Crystal Lake. The latest spring records based on specimens are those furnished by Mr. Kirkpatrick: French Creek, May 19, 1906, and May 20, 1925. We saw four Bluebills at Crystal Lake on May 31, 1924, which I feel confident were of this species. Mr. Todd took a female with ova "as large as No. 4 shot" at Crystal Lake on June 28, 1899. It may be that this bird was nesting, although no male was seen. Perhaps the bird was crippled in some way. Mr. Langdon observed a flock of twelve birds throughout the month of June, 1926, at Conneaut Lake. These were no doubt non-breeding birds.

While the present species is common in the fall, our only records based on actual specimens are furnished by Mr. Kirkpatrick and Mr. Welshons. On October 25, 1878, along French Creek, Mr. Kirkpatrick took a male from a large flock in which both species were probably represented. On November 4, 1926 Mr. Welshons took a male at Conneaut Lake. Like the Scaup this species doubtless remains until early or mid December, and may even, occasionally, spend the winter.

34. *Perissonetta collaris* (Donovan). RING-NECKED DUCK (150).

Although we have comparatively few actual records for this migrant species, it is probably considerably commoner than is supposed. Mr. Welshons has taken at least twelve specimens, Mr. Kirkpatrick two,

and Messrs. Langdon, Keesler, and Bergstrom, each one. It arrives as early as the Scaup and Lesser Scaup, according to Mr. Kirkpatrick's Meadville record for March 15, 1899. Mr. Welshons took a female at Conneaut Lake on March 17, 1912, and three females on March 20 of the same year. On March 22, 1913, he saw a flock of forty, which contained about an equal number of males and females. Mr. Kirkpatrick took a male on April 2, 1895, along French Creek near Meadville, and Mr. Welshons took a female as late as May 5, 1912, at Conneaut Lake. On May 15, 1925, we saw a flock of five birds, three of which were males, at Conneaut Lake. Mr. Langdon noted Ring-necks as late as May 28, in 1926.

Our fall records are few. Mr. Bergstrom took a male at Conneaut Lake on October 15, 1926, and Mr. Welshons secured one from a small flock on October 18 of the same year. Mr. Welshons also took a male and female on October 18, 1926. Mr. Keesler examined a male specimen taken at Conneaut Lake in the fall of 1924, and took an immature male on October 24, 1925. Mr. Welshons took four males at Conneaut Lake on November 11, 1911. Mr. Langdon secured a very handsome adult female on November 26, 1925, which he sent in for examination.

In identifying this species in the field we found that the white mark on the bill especially of the male bird is so prominent as to give the impression that the bird is holding some white, shining thing (such as a small fish) in the tips of its mandibles. This mark is particularly noticeable when the sun is shining.

35. *Glaucionetta clangula americana* (Bonaparte).

GOLDENEYE; WHISTLER (151).

A fairly common and regular migrant, appearing early in spring, remaining late in fall, and occasionally occurring as a winter resident when the water is open. When the winter ice breaks up Whistlers are among the first ducks to appear. Mr. E. E. Hunter has known them to appear at Pymatuning in late February. Mr. Langdon saw them at Conneaut Lake on March 15, 1925. Mr. Welshons has taken numerous specimens at Conneaut Lake in the latter part of March: March 17, 1912, female; March 17, 1913, female; March 29, 1912, male. He and Mr. Kirkpatrick have taken specimens also in early April, their two latest dates being: April 8, 1888, French Creek, near Meadville (Kirkpatrick); and April 9 and 12, 1910, Conneaut Lake (Welshons). On April 24, 1926, at Conneaut Lake, Mr. Langdon

secured an immature male in changing plumage. Messrs. Langdon and Bergstrom have seen them commonly until late April and early May, though rarely as late as May 17, 1926. On May 15, 1925, after considerable chasing, we succeeded in identifying three female birds, which remained in the deepest waters of Conneaut Lake, where the Scoters customarily rest. Mr. Langdon noted one on May 25, 1926. Mr. Kirkpatrick observed some prolonged flights of this species, of two or three hours' duration, during late March and early April, about thirty-five years ago. Small flocks, passing at varying intervals were seen migrating up the French Creek valley.

In the fall the Whistlers usually do not arrive until late October or November, although Mr. Welshons took a female at Conneaut Lake on the remarkably early date of September 2, 1912. It is possible that this was a crippled or non-breeding individual. Mr. Welshons took a male on November 4, 1912, and Mr. Kirkpatrick took one November 5, 1924. Mr. Bergstrom saw a flock of forty on the Lake on November 9, 1925, and examined a male taken on November 23 of the same year. Mr. Keesler took a male on November 27, 1925. Our latest record is of a male taken by Mr. Welshons on November 29, 1912.

Glaucionetta islandica (Gmelin). BARROW'S GOLDENEYE (152).

This species may be expected to occur at Conneaut Lake as a casual winter resident, or as a late fall and early spring migrant. Two reports concerning the taking of male specimens have come to hand, one from a reliable source, but it is thought best to place the species on the hypothetical list, until locally collected specimens may be examined. The nearest point at which it has been actually taken appears to be Lorain County, Ohio (McCormick, *Auk*, IX., 1892, 397); Jones (*Birds of Ohio*, 1903, 44), and it is surprising that Mr. Todd did not find it at Erie (*Birds of Erie and Presque Isle*, 1904, 522).

Mr. Keesler states: "Last November (November, 1924) I was at the Lake and Mr. Andrews said he had killed a duck that none of them could identify. He described it to me and it undoubtedly was a Barrow's Goldeneye, as he gave a perfect description of a male bird."

36. ***Charitonetta albeola*** (Linnæus). BUFFLEHEAD (153).

A common and regular migrant both in spring and fall, not only at Conneaut Lake, but at the smaller bodies of water including the three lakes at Pymatuning. It arrives along with several larger species in mid March. Mr. Welshons took two males and a female on March 16, 1912, and two males on March 19, 1913. It is abundant during early

April, specimens having been taken by Mr. Welshons at Conneaut Lake on April 2, 3, 4, and 9, 1913 (both males and females), and April 10, 1912 (female); by Mr. Kirkpatrick, along French Creek, on April 12, 1899, and April 13, 1901; by Mr. Langdon at Conneaut Lake on April 14, 1925 (male and female); and by myself at Crystal Lake on April 29, 1922 (female). During 1926 Mr. Langdon noted it as the most abundant species present at Conneaut Lake on April 28. We saw a flock of eight at Crystal Lake on May 6, 1922, and Mr. Kirkpatrick took a male near Meadville on May 3, 1906. It thus remains in fairly large numbers until early May and in this respect differs from some of the other species which arrive early. The pair secured by Mr. Langdon on April 14, 1925, were probably mated, and although the flock of eight seen by us on May 6, 1922, were swimming close together, they were obviously in pairs and probably all mated. Mr. Kirkpatrick states that this species is sometimes very abundant along French Creek during migration, especially in the spring.

In the fall the Buffleheads move southward rather late. Mr. Bergstrom secured female specimens at Conneaut Lake on October 19, and at Lower Lake on October 23, 1925. Dates for all other fall specimens are considerably later: November 8, 1923, male, Conneaut Lake (Keesler); November 14, 1904, French Creek (Kirkpatrick); November 20, 1925, and November 22, 1922, Conneaut Lake (Keesler); and December 9, 1911, French Creek (Kirkpatrick).

Fresh specimens which were weighed showed that average males weighed four ounces more than the females.

37. *Clangula hyemalis* (Linnæus). OLDSQUAW (154).

A migrant, apparently commoner in spring than in fall, which sometimes occurs as a winter resident. Mr. Kirkpatrick's Conneaut Lake record for February 19, 1900, seems to represent the first of the northward movement (if indeed these individuals were not winter residents) and numerous specimens have been taken throughout March. On March 8, 1908, Mr. Welshons and his party shot seventy-eight. Unfortunately no special notes were taken on the plumage of these specimens. On March 25, 1913, Mr. Welshons took additional specimens. Both Mr. Welshons and Mr. Kirkpatrick have taken numerous specimens in April: April 1, 1888, French Creek (Kirkpatrick); April 8 and 9, 1913, four shot, Conneaut Lake (Welshons); and April 12, 1897, Meadville (Kirkpatrick). On April 16, 1925,

Mr. Langdon saw several at Conneaut Lake, and on April 15, 1926, recorded a large flock of over five hundred individuals. Mr. Welshons states that in his repeated visits to Conneaut Lake he has not seen any Oldsquaws since 1914, and it is true that our records for recent years, prior to 1926, are very few. Mr. Kirkpatrick states that these ducks were very abundant in 1907 from April 12 to 19, and large numbers were shot by the gunners at Conneaut Lake.

In fall all of our records based upon specimens are in November, although a large flight was seen in October, 1878, along French Creek, according to Mr. Kirkpatrick. Mr. Welshons took a male at the Lake on November 2, 1926. Mr. Keesler took specimens on November 3, 1924, female, on November 9, 1923, female, and on November 29, 1924, two males, one of which was in full winter plumage. Mr. Welshons secured a male and female at Conneaut Lake on November 29, 1912. So far as I can determine the Oldsquaw has not been seen at the smaller lakes. At Conneaut Lake it is seen, along with the Scoters, only in the deepest water.

***Somateria spectabilis* (Linnæus). KING EIDER (162).**

This species is a casual winter resident at Lake Erie, recorded from Sandusky, Cleveland, Buffalo, and Erie. In view of the several specimens taken by Mr. Sennett from local gunners on December 1, 1889 (shortly after the terrific storm of November 28 and 29), and subsequent specimens taken by Mr. Bacon and others (Todd, *Birds of Erie and Presque Isle*, 1904, 525, 526), it would seem reasonable to expect King Eiders at Conneaut Lake, especially after heavy winds from the north which occur while the water is open. One or two reports of "wintering big brown ducks" may, indeed, refer to this species, but no specimens have been examined to date.

38. *Oidemia americana* Swainson. SCOTER (163).

A rare but fairly regular migrant, which may occasionally occur in winter, when the deep water is free from ice. With the other members of the diving tribe the Scoter is found only in the deepest parts of Conneaut Lake. Mr. Welshons took an adult female specimen on March 21, 1912. Mr. Langdon saw several males (and presumably females) on April 8, 9, 10, 15, and 22, 1926, and on April 16, 1925; and Mr. Bergstrom remembers having killed an adult male during the fall of 1923, but the date was not recorded. There is an additional female specimen in Mr. Welshons's Hotel Iroquois collection for which we can find no date. Mr. Keesler took a young male on November 9, 1925. The present species is much rarer than the White-winged

Scoter at Conneaut Lake, but is not, apparently, as uncommon as the Surf Scoter.

39. **Oidemia deglandi** Bonaparte. WHITE-WINGED SCOTER (165).

A fairly common migrant and occasional winter resident, apparently by far the commonest of the scoters in this region. Its spring arrival is marked by Mr. Langdon's record for March 20, 1925, on which date he saw numerous scoters "most of which were certainly of this species." Mr. Welshons secured a female on April 9, 1913. Mr. Kirkpatrick took a specimen at Sugar Lake on April 10, 1916. Mr. Bergstrom recorded several on April 16, 1925, at Conneaut Lake. Mr. Kirkpatrick received one for mounting, which had been shot April 20, 1907. It may remain as late as early or mid May. On May 15, 1925, we saw a very handsome pair in the deepest water of Conneaut Lake. These birds were rather tame and allowed such close approach that the white eye of the male could be seen easily. In leaving the water they were exceedingly deliberate. On May 2, 13, and 28, 1926, Mr. Langdon noted a pair in this same portion of the lake.

In fall the White-winged Scoter sometimes returns early. Mr. Welshons took a male on September 11, 1910. Usually, however, it appears in latter October: October 18, 1926 male taken, Conneaut Lake (Bergstrom). Our other fall records are as follows: October 29, 1917, Conneaut Lake (Kirkpatrick); November 2, 1926, male taken, Conneaut Lake (Welshons); November 7, 1911, two females taken, Conneaut Lake (Welshons); November 14, 1925, several flocks seen, Conneaut Lake (Bergstrom); November 30, 1922, and December 1, 1917, Conneaut Lake (Kirkpatrick). One of Mr. Welshons's male specimens is in a most interesting stage of the moult from immature to adult plumage.

40. **Melanitta perspicillata** (Linnæus). SURF SCOTER (166).

An irregular migrant, apparently the rarest of the Scoters in the present region. We have but four records. On October 4 and 18, 1925, respectively, Mr. Bergstrom secured adult female specimens at Conneaut Lake and after skinning them forwarded them for examination. In one of these specimens the borders of the whitish areas on the sides of the head are somewhat sprinkled with deep brown spots. Neither bird was excessively fat. They were taken from large

flocks of Scoters, some of which were unquestionably males of the present species. Mr. Keesler took an adult female on October 24, 1925, and a handsome male on November 10, 1915. Mr. Langdon examined male specimens secured during the fall of 1923, but is not able to remember the dates of their capture. Mr. Welshons took three males at Conneaut Lake on November 4, 1926.

41. *Erismatura jamaicensis* (Gmelin). RUDDY DUCK (167).

A common migrant, said to be much more numerous in fall than in spring, although we happen to have many more spring than fall records. Our earliest spring dates are March 9, 1918, Crystal Lake (Hunter); March 15, 1925, Crystal Lake (Langdon). Mr. Welshons took one at Conneaut Lake on March 25, 1913. During April and May it is common, representative records being: April 4, 1913, Conneaut Lake (Welshons); April 9 and 10, 1925, Lower Lake (Langdon); April 24, 1894, Meadville (Kirkpatrick); May 1, 1922, female shot, Crystal Lake (Sutton); May 19, 1906, French Creek (Kirkpatrick). Occasionally one is seen much later in spring, or even in summer. Thus Mr. Kirkpatrick recorded a small flock from June 28 to July 3, 1897, near Wolf Island, Conneaut Lake. Mr. Langdon saw several as late as June 6, 1925, on Conneaut Lake, and during June, 1926, recorded small flocks on four dates; he noted them last on July 3.

In the fall the young birds are usually very numerous. Mr. Bergstrom saw a flock of four as early as August 3 and September 16, 1926, and recorded the species as abundant from October 1 to 20, 1925. Mr. Kirkpatrick secured a specimen along French Creek on October 29, 1917. We have many records in early and mid November, the latest dates being: November 6, 1925, thirty-five specimens examined, Conneaut Lake (Bergstrom); November 11, 1925, male and female, and November 14, 1922, male and female taken, Conneaut Lake (Keesler); November 14, 1912, female taken, Conneaut Lake (Welshons); November 17, 1924, male and female taken from large flock, Conneaut Lake (Keesler); November 23, 1925, male taken, Lower Lake (Bergstrom); November 26, 1925, adult male in winter plumage taken, Conneaut Lake (Langdon).

In the spring the Ruddy Duck often occurs at Crystal and Lower Lakes, but in the fall it is noticeably more abundant at Conneaut, preferring the more open stretches of water.

42. *Chen hyperboreus nivalis* (J. R. Forster).

GREATER SNOW GOOSE (169a).

Regrettably we have no actual specimen, upon which to base our identification of the Snow Goose as occurring in this region, although the present form is more likely to occur than *hyperboreus*, the normal range of which is known to be more western.

On March 15, 1915, and March 24, 1924, Mr. Kirkpatrick saw immense flocks of snow-white birds passing over Meadville. Their wing-tips were black and the line of flight was different from that of the Canada Goose. "One flock," says Mr. Kirkpatrick, "must have had five hundred individuals." Among the white birds were a few dark colored ones, probably immature, or possibly Blue Geese (*Chen caerulescens*) for which we have no authentic record at present. Mr. Kirkpatrick has also noted Snow Geese in the fall, a flock of about fifty individuals having passed over Meadville on October 29, 1922.

Mr. George Wilson of Conneaut Lake Park saw a flock of eight Snow Geese on November 12, 1920. These birds were observed to good advantage, and compared directly with the much larger Whistling Swans which were present at the same time. None of these was shot and they were not seen on the following day, apparently having left during the night. Mr. Walter Long of Conneaut Lake shot a Snow Goose some years ago (about 1915). It was mounted and kept in a club house which was subsequently destroyed by fire. There are other reports of flocks of white geese, but in many cases the birds have doubtless been confused with swans, which are at times abundant.

Mr. Langdon saw what he believes to have been a crippled Greater Snow Goose on December 2, 1925, at Conneaut Lake. It flew very heavily and was seen at close range, but unfortunately was not collected, so that, even with these several records at hand, there is still some uncertainty as to the exact species represented.

Chen caerulescens (Linnæus). BLUE GOOSE (169.1).

Since the Blue Goose almost certainly traverses this section of the United States at times in going to and from its winter feeding-grounds on the Gulf Coast and its breeding-grounds in the far North, we may reasonably expect it to be found about Conneaut Lake both in spring and fall, at least until something more definite is known about the migratory movements of this interesting waterfowl. It is decidedly possible that certain dark-colored individuals noted among the flocks of Greater Snow Geese by Mr. Kirkpatrick at Meadville were of this species.

43. *Anser albifrons gambelli* Hartlaub.

WHITE-FRONTED GOOSE (171a).

A very rare and irregular migrant. Mr. Welshons saw a small flock on the ice at Conneaut Lake on March 8, 1908, but unfortunately did not procure a specimen. Mr. Langdon saw a flock of thirteen birds on April 3, 1926. These were examined to good advantage and their yellow feet were noted. One or two hunters have secured specimens during former years but these were not preserved. Mr. Todd did not record it at Erie (*Birds of Erie and Presque Isle*, 1904, 528).

44. *Branta canadensis canadensis* (Linnæus). CANADA GOOSE (172)

A common and regular migrant, sometimes abundant. In spring it often appears very early, having been recorded by Mr. Kirkpatrick near Meadville on February 11, 1898, and on February 8, 1900. Mr. Langdon saw a flock of fifty standing about on the ice at Conneaut Lake on February 24, 1925. During some years the earliest flocks do not appear until March: March 1, 1902, March 4, 1894, March 9, 1910, March 10, 1901, Meadville (Kirkpatrick); March 10, 1926, Conneaut Lake (Bergstrom); March 12, 1925, and March 29, 1926, Conneaut Lake (Langdon). We have but few records in April, the latest being those of Mr. Kirkpatrick for April 20, 1901, and of Mr. Langdon for April 23, 1926. On the former date one was shot at Conneaut Lake by Mr. John S. Matson of Greenville, Pennsylvania. In June, 1924, a crippled bird was seen at Hartstown. It had been shot from a flock, which passed over Pymatuning Swamp in early April of that year.

In fall it passes through in the latter part of October and November, our representative dates being: October 21, 1925, Shermansville (Bergstrom); November 3, 1913, Meadville (Kirkpatrick); November 8, 1923, a single bird secured, Conneaut Lake (Keesler); November 9 and December 25, 1925, large flocks seen, Conneaut Lake (Bergstrom). While these great birds customarily stop at Conneaut Lake, they are also often seen at Crystal and Lower Lakes, where they have been known to remain for several days at a time, especially during disagreeable weather.

45. *Branta bernicla glaucogastra* (Brehm). BRANT (175).

Since no specimen of this rare and irregular visitant, and essentially maritime bird, has been preserved, the form occurring here is open

to some question, although the range of this sub-species more nearly includes the present region than does that of *b. bernicla*. Mr. E. G. Peterson, of Conneaut Lake, shot two specimens during the late fall of a former year, and Mr. Langdon states that in the fall and early winter of 1910-11 Brant were fairly common on the deeper waters of Conneaut Lake. Mr. Welshons saw a small flock in the late fall of 1907. Mr. Todd did not record it at Erie (*Birds of Erie and Presque Isle*, 1904, 529).

46. **Cygnus columbianus** (Ord). WHISTLING SWAN (180).

A rather rare and irregular migrant, which sometimes occurs in immense flocks, and then again may be absent for years at a stretch. In Spring it arrives in March and sometimes remains at Conneaut Lake for several weeks, particularly if the flocks are not disturbed. Mr. Welshons saw four from March 18 to 21, 1913. Mr. Langdon saw a large flock on March 18, 1925.

Warren speaks of unusual flocks of swans observed by Mr. Sennett and others in the vicinity of Erie, Oil City, and Meadville (*Birds of Pennsylvania*, 1890, 51, 52). This flight took place on March 22, 1879, and he states that two were taken near Meadville. I have not been able to locate these specimens.

Mr. Kirkpatrick saw huge flocks passing over Meadville on March 24, 1895. One was shot at a small pond in Island Park within the limits of Meadville on March 25. This individual was probably one of a flock which passed over and circled about Meadville during the preceding night. Mr. Henderson took a beautiful adult at Conneaut Lake on March 25, 1905, which is at present mounted in the Carnegie Museum. On March 27 and 29, 1926, Mr. Langdon saw large flocks at Conneaut Lake, with one dark individual, which was probably a young bird. Mr. Bergstrom saw a flock of at least two hundred of these magnificent creatures several times on March 30, 1925, at Conneaut Lake. On April 1, 1925, several citizens of Hartstown observed a flock of seventeen at Crystal Lake. Three of these showed evidences of immaturity. Mr. Kirkpatrick saw flocks on April 1, 1900, and April 11, 1896, near Meadville, and Mr. Welshons took a male at Conneaut Lake on April 9, 1908. Mr. Keesler saw flocks of swans during 1923 and 1924, at one time a noisy raft of almost a hundred individuals. While these great birds customarily frequent the open

portions of Conneaut Lake, they have been known to descend to the smaller lakes at Pymatuning upon several occasions.

In the fall Whistling Swans have been chiefly noted in November and December. On October 18, 1926, Mr. Bergstrom noted a flock of forty-five flying over Conneaut Lake. Mr. Welshons saw flocks at the Lake on October 18 and 20 and November 2, 1926. On November 26, 1904, Mr. Kirkpatrick saw a flock near Linesville. On December 18, 1926 Mr. Langdon noted a southbound flock of about forty birds above the Lake. On December 21, 1924, a swan, believed to be of this species, was seen at Crystal Lake by Merl Hutchens and others; it had apparently strayed from its fellows. Mr. Kirkpatrick has seen specimens of the Whistling Swan taken at Conneaut Lake, Lake Canadohta, French Creek near Cambridge Springs, Cochranon, Conneaut Marsh, and Woodcock Creek.

Mr. Kirkpatrick states that since the installation of the Meadville electric lighting system in 1885 there have been numerous instances where migrating flocks of waterfowl have lost their way and have been confused by the lights of the city. Many birds were thus lured to destruction by the lights.

Olor buccinator (Richardson). TRUMPETER SWAN (181).

Mr. William Foust of Conneaut Lake is said by Mr. Welshons to have taken a Trumpeter Swan at the Lake in November, 1909. I have not been able to locate this specimen, although I understand it was preserved. A swan in Mr. Welshons's Hotel Iroquois collection seems to have over twenty rectrices, but the contour lines of the bill and relative position of the nostril and eye are decidedly those of *Cygnus columbianus*. The Trumpeter Swan apparently is not common anywhere in migration, and it is decidedly rare throughout the eastern United States.

47. **Botaurus lentiginosus** (Montagu). BITTERN (190). (Pl. IX, fig. 2).

A common migrant throughout the region, and a locally abundant summer resident in the marshy areas of Pymatuning Swamp, at the head of Conneaut Lake, and at several points in the Conneaut Marsh. While Mr. Langdon recorded it at Conneaut Lake as early as March 29, 1926, it is thought that Mr. Welshons's record for April 7, 1913, Mr. Bergstrom's record for April 16, 1925, and Mr. Kirkpatrick's for April 17, 1892, are somewhat more representative of the customary time of vernal appearance. The first arrivals probably pass to the northward to nest; by the first of May the local nesting population has arrived and evidences of courtship are to be heard and seen on every hand.

Occasionally three or four birds pursue each other about the marsh, squawking loudly or circling high in air. Booming and plume-display begin almost as soon as the resident birds arrive, and by May 5 is at its height. The nest is completed during the first and second week of May.

A nest with three fairly fresh eggs was found near Hartstown on May 15, 1923. These were collected on May 17. The female was approached very closely. The nest was built in the wildest portion of the marsh and was surrounded by very high sedge grass. On May 30, 1924, a nest and one fresh egg was discovered. This may have been a second set, for on May 31 a nest with four much incubated eggs was found not far distant. On July 2, 1913, Mr. Welshons secured a juvenal female at Conneaut Lake.

In the fall the young birds are much in evidence, chiefly because they flush close at hand and fly about in an awkward, bewildered manner. They were fairly common at Conneaut Marsh until September 19, 1925, and thereafter became rarer. Mr. Kirkpatrick saw one as late as November 6, 1916, at Conneaut Marsh, near Custards.

A male bird observed on May 15, 1925, was remarkably tame, as he displayed his plumes and boomed in front of us. The white shoulder plumes fell like a misty spray on his back. The queer, clicking, booming call was accompanied by fantastic bows and expansion of the neck and breast. The residents of Conneaut Lake, and Pymatuning customarily call this species "Bum Cluck." The name is a very fair imitation of the queer courtship cry.

48. *Ixobrychus exilis exilis* (Gmelin). LEAST BITTERN (191).

A fairly common migrant and irregular and local summer resident in the marshy sections of Pymatuning, at the head of Conneaut Lake, and along the cat-tail margins of Sandy Lake in Mercer County. The bird is so retiring in habit that usually it is not seen; therefore the exact dates of its arrival and departure are almost impossible to determine. Warren states that Mr. Sennett regarded it as an occasional summer resident in Crawford County (*Birds of Pennsylvania*, 1890, 56). In the spring it arrives in May: May 3, 1897, Conneaut Marsh (Kirkpatrick); May 8, 1926, Conneaut Lake (Langdon); May 17, 1893, Meadville (Kirkpatrick). We saw one at Conneaut Lake on May 15, 1925. Mr. Welshons took specimens at Conneaut Lake on May 29 (male), June 5 (male), and June 6 (female), 1913. Mr.

Langdon recorded it on May 29, June 5-7, 1925, and throughout June and July, 1926, near Conneaut Lake Park. In the cat-tail marshes of Pymatuning it was not detected prior to June 29, 1927, on which date several were noted, but no nests found. On June 30 several were seen in the dense cat-tail growth three miles north of Hartstown, and one individual which was observed at dusk sat in the alders for fully twenty minutes, scarcely moving a muscle while it was being watched.

At Sandy Lake I found a nest and two eggs from which the female was closely flushed on June 1, 1924. When I returned subsequently the eggs were gone. They had probably been eaten by the parent. Young birds were seen by Mr. Kirkpatrick on June 28, 1897, at Conneaut Lake.

In the fall Mr. Kirkpatrick has seen it as late as September 25, 1895, at a small swamp two miles south of Meadville.

I have never witnessed any courtship antics of this species, and the only sounds heard from it are hoarse, throaty squawks, resembling those of the Green Heron, but not nearly so loud.

49. *Ardea herodias herodias* Linnæus.

GREAT BLUE HERON (194).

Regular and fairly common as a migrant; common, though not present in great numbers as a summer resident. It sometimes nests, although most of the summering birds apparently do not. These summer birds may be non-breeding individuals; or it may be that the adults seek food in the present region far from adjacent nesting-grounds. It is significant that at Pymatuning Great Blue Herons are frequently seen flying high in air, apparently headed for some distant point. As a rule but one or two of these magnificent creatures are seen at a time. Occasionally, however, and particularly during migration, a small flock may be observed.

The Great Blue Heron usually arrives in early April according to Mr. Kirkpatrick's records, although he has recorded it at Conneaut Marsh as early as March 25, 1911. Average dates of arrival according to Mr. Kirkpatrick are: April 3, 1919, Conneaut Lake; April 4, 1900, Meadville; April 5, 1909, Meadville; April 13, 1901, Conneaut Marsh. Mr. Welshons secured a female on May 10, 1908, and a male on May 16, 1912, at Conneaut Lake.

Three huge, sprawling nests noted in the high black birches at Cherry Island on May 4, 1922, were certainly the vestiges of a Great

Blue Heron colony which existed there in a former year. No nest with eggs has been found in the region to the best of my knowledge. However, Mr. Langdon saw three young birds, scarcely able to fly, on September 4, 1925, near Meadville.

In the fall it remains until November and December, having been recorded as late as November 1, 1911, Conneaut Lake; November 30, 1897, Meadville; and December 3, 1897, Meadville, by Mr. Kirkpatrick. Mr. Bergstrom examined a male which had been found frozen to death in a swamp near Meadville, on November 28, 1925. This specimen was preserved. Mr. George Wilson of Conneaut Lake Park saw one on the remarkable date of January 12, 1926.

50. **Casmerodius albus egretta** (Gmelin). EGRET (196).

Like the Little Blue Heron, this species is known to wander widely from its southern breeding range during late summer and early fall. It may be expected occasionally in the present region. Mr. Welshons repeatedly saw three individuals at the southern end of Conneaut Lake from August 15 to September 12, 1925. Their yellow bills, black feet, and large size were noted carefully. The birds are usually seen together. Mr. C. J. Seiple and John J. Donaldson of Greenville, saw one daily for two weeks from August 11 to 25, 1926, at Kidd's Mills, Mercer County, three miles south of Greenville (*Auk*, XLIII, October, 1926, 537). Mr. Todd includes the Egret in his Erie list hypothetically (*Birds of Erie and Presque Isle*, 1904, 531).

51. **Florida cærulea cærulea** (Linnæus). LITTLE BLUE HERON (200).

Warren (*Birds of Pennsylvania*, 1890, 60) states: "In the counties of Crawford and Erie, Messrs. George B. Sennett of Erie City, and H. C. Kirkpatrick of Meadville, have found the Snowy Heron only as a very rare and irregular visitor." In the light of our present knowledge of the summer wanderings of the white herons, and particularly since no specimen was taken by either Mr. Kirkpatrick or Mr. Sennett to substantiate their identification, it seems much more plausible to me to regard the white herons which these observers saw as Little Blue Herons in the white phase of plumage, since this species customarily wanders much farther north of its normal southern range than does the Snowy Heron (*Egretta thula thula*). Mr. Kirkpatrick has seen such small, white herons near Meadville in August of 1885 and during the fall of 1891.

Our only record is of a single individual seen at Lower Lake on August 29, 1925. There can be no doubt as to the identification of this individual, because the feet and legs were pale green. The bird flew toward Conneaut Lake. Mr. Edgar Huidekoper of Meadville has also seen a small white heron near Meadville.

52. ***Butorides virescens virescens*** (Linnæus). GREEN HERON (201)

Abundant as a migrant and summer resident not only at the larger bodies of water but along the smallest streams. It arrives shortly after the middle of April: April 20, 1898, and April 20, 1906, Meadville (Kirkpatrick); and becomes common by the first of May, at which time most of the summer residents are mated or courting. The nest is built during the first week of May. We found a nest and four eggs two miles north of Hartstown on May 12, 1922. On May 18, 1922, we discovered a fair-sized colony of Green Herons in a high stand of huckleberries, which grew in a pool of water about a mile southeast of Hartstown. This thickly upgrown spot was sheltered from the nearby road by great trees and was a spot ideally suited to the nesting activities of this species. At least eight nests were found here, one of which was only three inches above the surface of the water. Most of the nests were high in the slender bushes and rather difficult to reach. On May 20 and 25 isolated nests containing five and four eggs respectively were found in hemlock trees far from water. Other nests were found in dense hawthorn trees two miles north of Hartstown, and one nest, containing five eggs, was placed in a slender maple in the deciduous woods on the ridge west of Hartstown. The young remain in the nest or in the home tree for some weeks. Mr. Theodore Kiskadden found a nest with four young which left the nest on June 26, 1927. Mr. Kirkpatrick found a nest with three half-grown young near Meadville on July 11, 1914. Mr. Milo H. Miller found a nest with young near Hartstown on August 25, 1925. We found nests with fresh eggs on May 12, 1925, and on June 1, 1924. Probably the latter date represents a second set for the season. Mr. Kirkpatrick has seen nests in the French Creek Valley far from water built in thickets on hill-slopes at considerable elevation above the valley plain.

Green Herons were common until September 14, in 1925. Mr. Welshons took a male and female at Conneaut Lake on September 22, 1912. Probably the species remains a month later, but we have no actual record later than this.

53. *Nycticorax nycticorax nævius* (Boddaert).

BLACK-CROWNED NIGHT HERON (202).

A rare summer resident, or possibly merely a summer wanderer, for which we have but four records. Mr. Welshons took an adult male at Conneaut Lake on June 15, 1910, and an immature female on August 20, 1910. I am not certain that this latter specimen was a bird of the year, and even less certain that it was reared locally. Mr. Langdon saw an adult at Conneaut Lake on July 3, 1926. Mr. Kirkpatrick examined an adult specimen on October 30, 1916, which had been taken along the eastern shore of Conneaut Lake.

54. *Rallus elegans elegans* Audubon. KING RAIL (208).

A rare and infrequently recorded migrant, which sometimes occurs locally in the summer and should occasionally nest, although we have no breeding record at present. Mr. Kirkpatrick took a male at Conneaut Marsh on April 17, 1909. Mr. Welshons secured a male and female at Conneaut Lake on May 2, 1912; on May 14 and 17, 1910, respectively, he also took a female and male. In view of Mr. Kirkpatrick's mid-summer record for August 3, 1898, Meadville; Mr. Langdon's for Conneaut Marsh—June 11 and 28, 1926; and Mr. Rufus C. Adams's specimen taken at Espyville on July 31, 1895 (now mounted at the Oakland Beach Hotel), none of which records could well represent any migration movement, it does, indeed, seem plausible that this handsome rail may occasionally nest in the present region.

I saw a very tame, and probably immature individual cross the road near Crystal Lake on September 17 and 18, 1925. This date probably marks the first of the fall migration movement. Mr. Keesler was presented with a specimen taken at Conneaut Lake by a Mr. Boyle on November 22, 1922. This bird was caught in a muskrat trap.

55. *Rallus virginianus* Linnæus. VIRGINIA RAIL (212).

(Pl. IX, fig. 1).

Fairly common as a migrant and locally abundant as a summer resident, known to nest in the marshy areas in and south of Pymatuning, at the head of Conneaut Lake, throughout Conneaut Marsh, and at several other suitable spots. It arrives shortly after mid April:

April 18, 1925, Shermansville (Bergstrom); April 24, 1909, Meadville (Kirkpatrick); and nesting operations begin almost at once.

We found nine nests, all with eggs. A nest just ready for eggs was found near Crystal Lake on May 4, 1922. Nests with eggs (nine and ten respectively) were found on May 16, 1923, and May 16, 1925. A nest and nine eggs, with the female bird, were collected on May 17, 1923. On June 1, 1924, a female was observed building a nest. She was from time to time disturbed by other rails with which she often fought. Our latest date for a nest with eggs is May 31, 1924, Hartstown (Sutton). All the nests were built in cat-tails, and they were always placed near water-ways, in three cases on a peninsula-like stand of low cat-tails which extended out into the open water. The nests were built but little above the surface of the water, and when the females were not incubating the eggs were covered lightly with cat-tail leaves. In flushing, the females often waited so long that one nest was kicked over, and one egg (one of a set of ten) broken. The birds were not wild and more than once I saw the females running about near their nests, climbing over the rim to brood an instant, and then running away, all the while puffing out their feathers like tiny hens. The young birds hatch in early June and develop rapidly. On September 9, 1925, an immature bird was secured at Crystal Lake in which the post-juvinal moult was only well commenced. Most of the plumage was gray and much frayed. The plumage of the sides and neck was particularly poor. One adult was seen on September 11, 1925, at Crystal Lake. Although this is our latest actual fall record, the migration southward probably does not take place until a month later.

Hailstorms are sometimes very severe in this region and as a result the Virginia Rails and other marsh-inhabiting species suffer badly. Mr. Ernest G. Holt tells of a nest in which he found all the eggs broken, and the female dead, with her skull crushed, as a result of the severe hail-storm of May 23, 1925 (*Cardinal*, No. 6, July, 1925, 24).

With reference to the present species, Mr. Kirkpatrick writes: "I have found that both Virginia and Carolina Rails trust to concealment rather than to flight in escaping detection. Some years ago while spring snipe hunting at Conneaut Lake Marsh, I discovered a Virginia Rail in a small bunch of button brush, interspersed with tussocks and small grass. Although I tramped all over this spot for

some time the bird would not flush, but passed from one tussock to another as quick as a flash, resembling, in this respect, a field mouse or shrew which we often see in our traps through marshy ground. I kicked this individual out of the tussocks a number of times, but it made no effort to take wing, so I gave it up and went my way."

56. *Porzana carolina* (Linnæus). SORA RAIL (214).

A common migrant in suitable situations and fairly common summer resident, which is certainly known to have nested only in the cat-tail marshes, near Hartstown and Linesville.

Our records, which are probably far from complete and representative, seem to indicate that the Sora arrives later in spring than the Virginia Rail. Mr. Welshons's earliest date of vernal appearance is May 6, 1911 (male taken). He took a female at the Lake on May 7, 1909. Our own first records are even later. We found a dead male at Hartstown on May 13, 1922, which had been killed by a Marsh Hawk. Its head had been torn off and the body was still warm when the hawk was frightened from its prey. Rails are so seclusive that they are seldom seen, even when they are arduously pursued. Soras may have been present for many days prior to May 13, but none was seen. In 1923 and 1924 we saw several in the middle and latter part of May, which were presumably nesting. A mother and at least fourteen young were seen on May 25, 1922, and the nest with numerous broken eggshells was found nearby. The young were exceedingly hard to count; there may have been more than fourteen. Probably the Sora nests at the head of Conneaut Lake and in Conneaut Marsh, wherever there are large areas of cat-tail cover. In the collection of Mr. J. G. Crumb is a single egg of this species taken in early June, 1895, near Linesville.

In the fall we saw what we believed to be migrating birds as early as August 27, 1925, at Conneaut Marsh. By September 3 they were quite numerous in the savanna-like stretches of low country south of Conneaut Lake. On August 29, 1926, Mr. Bergstrom saw several in the marsh at the Outlet. On September 5, 1926, Mr. Welshons took a female at Conneaut Lake. On September 12, 1925, we shot an immature male south of Crystal Lake. It was very tame and fed along the low road which passes between Crystal and Lower Lakes. Mr. Kirkpatrick took one and saw six more near Meadville on Sep-

tember 18, 1893. They were fairly abundant on September 23, 1925, at Conneaut Marsh.

Mr. Kirkpatrick writes interestingly concerning his experiences with this species: "I have often seen this rail in parties of six to eight in the swamps near the course of French Creek. Here I have observed them with tails erect tripping over the debris of the shore and over the lightest drift-wood in the water, pausing not a moment before an open space but dropping into the water and swimming like a duck to the next point of drift. Sometimes, when flushed from the shore, they fly into a large clump of button-brush, and, jumping and stepping from branch to branch and bush to bush, their long toes admirably adapted to climbing and grasping the branches, they are soon out of sight in the recesses of the Swamp."

Coturnicops noveboracensis (Gmelin). YELLOW RAIL (215).

Although we searched diligently for this species in every possible marsh where it might be found, we did not find it; and no specimen seems ever to have been taken at the Swamp or at Conneaut Lake. Mr. Bacon, however, found it fairly common at Erie (Todd, *Birds of Erie and Presque Isle*, 1904, 533), and it is reasonably certain that this rail occurs at least during migration in the Pymatuning region. Doubtless the finding of this species depends upon untiring search for it during latter April and early May, September, and early October, the months during which they were found at Erie by Mr. Bacon. It may be found in the present region as a nesting species.

57. **Creciscus jamaicensis jamaicensis** (Gmelin). BLACK RAIL (216).

A very rare migrant and possibly summer resident for which we have but one certain record. Mr. Keesler says that he saw several Black Rails near Conneaut Lake at the time of the autumn field trials for dogs on September 5, 6, and 7, 1917. Concerning these he says: "Observed several Black Rails. We were running our dogs in field trials at the time and the dogs pointed some of them; it was just south of the fair-grounds at the Lake, in swail. I was close to several when flushed and am positive of them."

I attended the Conneaut Lake field trials of the Wild Life League in 1925 and although I noted several Virginia Rails I saw none of the much smaller species.

On September 7, 1925, however, a Black Rail was seen at the remarkably close range of about six feet, along the southern shore of Crystal Lake. This bird was watched for several minutes. It was not collected, because it could not be frightened to a sufficient dis-

tance for shooting, and once it was behind the screen of vegetation it was lost to view. A passing crow finally frightened it away. The red-brown neck patch was a prominent mark and the bright red eyes were unmistakable.

Ionornis martinicus (Linnæus). PURPLE GALLINULE (218). BLACK RAIL (216).

This tropical species is decidedly rare in Western Pennsylvania. However, there are so many records for northern states and for New York, Massachusetts, and New England in particular, that we have reason to believe that Purple Gallinules occasionally occur in the present region. If so, it will likely be in the migration season, during April and May and September and October.

58. ***Gallinula chloropus cachinnans*** Bangs.

FLORIDA GALLINULE (219).

Although Mr. Todd's work at Erie has virtually proved that this species does not nest there (*Birds of Erie and Presque Isle*, 1904, 534) it is certain that a few pairs breed at Pymatuning and Conneaut Lake, though not so commonly, apparently, as at the head of Sandusky Bay (F. W. Langdon, *Journal Cincinnati Society of Natural History*, III, 1880, 228), where we found them common during early July, 1927, at Winous Point. It is not common as a migrant, and apparently is more often seen in fall than in spring.

Our only record which even approximates a date of arrival is that of Mr. Bergstrom for Meadville Junction Pond, May 10, 1924. We saw one near Hartstown on June 18, 1923. This bird was noisy and nervous and approached us closely. I do not doubt that it had a nest. Mr. Welshons took a male on July 6, 1911, at Conneaut Lake. Dr. C. A. Darling found an immature specimen dead in his yard at Meadville on August 18, 1925. Mr. Welshons and Mr. Bergstrom took a male and female on August 29, and a juvenal female on September 2, 1926, in the marsh about the outlet of Conneaut Lake. Not before September 5, 1925, did I find locally reared young birds. On this date a family of about eight young, in very odd, poor plumage were seen with their parents at Lower Lake. Two days before (September 3) we saw two young at the outlet of Conneaut Lake. Perhaps these too were locally reared, for they were observed in an ideal nesting-habitat. Mr. C. J. Seiple of Greenville noted Gallinules in the swamp just south of Conneaut Lake from July 1 to 10, 1926. On August 11 he saw first a parent and one young and later a parent and four young. In a letter he writes interestingly of the incident as

follows: "The female and one young bird were on a log feeding, when a turtle crawled onto the log between them. Both birds jumped a little and seemed somewhat frightened, but soon the old one approached the turtle and ate something or other from the turtle's back."

On June 30, 1927, I found a nest with seven eggs at the very edge of the channel of the Shenango river about four miles north of Hartstown. The structure was well sheltered with cat-tail leaves and was built between cat-tail stalks about a foot above the water. The female, which was seen but once, grunted considerably in the cat-tails nearby. The eggs appeared to be quite fresh. So far as I have been able to determine this is the first nest of this species which has been discovered in Western Pennsylvania.

Mr. Kirkpatrick's records constitute our only knowledge of the fall migration. He mounted specimens taken on September 28, 1886, and on October 5, 1895. The latter specimen was taken by Mr. Rufus C. Adams at Conneaut Lake. It is now in his collection at the Oakland Beach Hotel.

59. *Fulica americana* Gmelin. COOT (221).

Like the last species, the Coot is known to nest at Pymatuning, although it apparently does not breed at Erie (Todd, *Birds of Erie and Presque Isle*, 1904, 534). Since the same factors probably influence the occurrence of these two species in summer, it is interesting indeed that regions, so similar geographically and ecologically as the marshes at Erie and those at Pymatuning and Conneaut Lake, apparently do not have all qualities or factors in common. Thus far (perhaps due to lack of intimate knowledge of conditions at Erie) I can see no essential difference in the characters of the two regions, insofar as they are concerned with a nesting environment for the Coot and Florida Gallinule. Perhaps the adjacent open water at Lake Erie with its consequent occasional severe winds, and changes of water-level, has something to do with it.

At Pymatuning and Conneaut Lake the Coot is far commoner as a migrant than as a summer resident. It appears a little after the middle of March: March 18, 20, 30, 1925, Conneaut Lake (Langdon); March 22, 28, 29, 1913, Conneaut Lake (Welshons). Toward the end of March it is usually abundant, and it sometimes occurs at Conneaut Lake in immense flocks, which almost cover the surface of the water.

Messrs. Bergstrom and Langdon saw such flocks on March 30 and April 24, 1925. In the open waters of Conneaut Lake the spring migrants linger until the middle of May. We saw several in company with Lesser Scaups on May 15, 1925. On May 2, 1925, a number of guests at Conneaut Lake Hotel saw a Duck Hawk strike, kill, and carry away a Coot, not far from the shore. It was obviously a heavy load. Mr. Langdon saw a Coot at Conneaut Lake as late as May 29, 1925. This may have been a summer resident. On May 31, 1923, I saw an adult with two very small black young in a secluded marsh about three miles north of Hartstown. The season had been very dry and all water-birds were forced to exist along the narrow margin of the stream. When I walked through the grass and cat-tails here, rails seemed unusually numerous, the reason being, of course, that the population composed of the local water-birds was much concentrated. The Coot seen was not accompanied by a mate, but the young followed the parent across the stream and into the alders. What I believe to be the deserted nest was also found. Mr. Louis Schaffer, who lives near Hartstown, has known Coots to nest at his pond several times. During June, 1924, he saw a mother and young regularly each day for a month.

In the fall the Coot arrives early, although it is impossible to distinguish the first transients from the summer residents. Five were seen by Mr. Langdon along French Creek near Meadville on August 25, 1925. On August 30 I saw one near Westford. Thereafter individuals or pairs were seen daily. Even as late as September 22 (one seen at Crystal Lake) only single birds or very small groups were seen. By October 1, however, Mr. Bergstrom recorded large flocks at Conneaut Lake. Mr. Keesler took a few specimens from a huge flock, which he saw on November 17, 1924, at Conneaut Lake. One seen at very close range at Crystal Lake on September 8, 1925 called "Kep, kep, kep" as it swam out from the shore, its head bobbing regularly.

Phalaropus fulicarius (Linnæus). RED PHALAROPE (222).

Although a maritime species, the Red Phalarope has been recorded several times inland, and Mr. Todd cites two records for Erie, both in October (*Birds of Erie and Presque Isle*, 1904, 535). At Conneaut Lake this phalarope may occasionally occur along with other rare stragglers, such as Brünnich's Murre. It is to be looked for in the open water where it swims about like a duck.

60. **Lobipes lobatus** (Linnæus). NORTHERN PHALAROPE (223).

Warren's statement that this species is a "rather regular" migrant at Erie Bay and along the lake shore is doubtless misleading (*Birds of Pennsylvania*, 1890, 76). Mr. Todd mentions three records for the vicinity of Erie (*Birds of Erie and Presque Isle*, 1904, 535). If it is at all regular at Erie there is no reason that it should not occasionally be seen at Conneaut Lake or about the nearby bodies of water, although, as stated in the introduction to the present paper, many shore-birds may entirely skip the Pymatuning region in their first day's southward flight from Lake Erie. However, we are able to add three records to those cited for the Erie region. All of these are in the fall, and all are from Conneaut Lake: on August 29, 1926, Mr. Bergstrom and Mr. Welshons took an adult male; on September 7, 1911, a male was taken by Mr. Welshons; on September 24, 1909, Mr. Kirkpatrick took one. Mr. Langdon saw a small bird "swimming about like a little duck" on October 10, 1921, along Oil Creek, about three miles from Titusville. The last record unquestionably concerns a Phalarope, although the exact species is, of course, open to question.

Steganopus tricolor Vieillot. WILSON'S PHALAROPE (224).

While Warren's statement leads us to believe that this species sometimes occurs at Erie in the fall (*Birds of Pennsylvania*, 1890, 77), there are no specimens to substantiate the remark, and the chances are that it is a very rare bird. Mr. Todd includes it in his list, however, believing that it probably occurs at times (*Birds of Erie and Presque Isle*, 1904, 536). If it occurs at all at Conneaut Lake, it is only as a rare and irregular straggler.

61. **Recurvirostra americana** Gmelin. AVOCET (225).

This handsome wader may have occurred in the present region rather regularly fifty years ago. We have but one record. Mr. Welshons took an adult on May 16, 1905, at the head of Conneaut Lake. The bird was alone; it was secured early on a misty morning. This specimen, which is mounted, is at present in Detroit, Michigan. Neither Mr. Todd (*Birds of Erie and Presque Isle*, 1904) nor Warren (*Birds of Pennsylvania*, 1890) mentions this species even hypothetically, which is evidence of its great rarity.

62. **Rubicola minor** (Gmelin). WOODCOCK (228). (Pl. VII).

Formerly an abundant and fairly regular migrant and common summer resident. Today it is common only occasionally as a migrant,

and decidedly uncommon as a summer resident, save in a few favored localities. When Mr. Todd visited the Crystal Lake region in 1895 he found nesting Woodcocks amazingly abundant. Today only a pair or two remain of all that host. This is due partly to change of the environment, since some of the very region under question has been reclaimed; but it is due also to the overwhelmingly severe shooting of these splendid birds, along with the deadly freezes, which have killed hundreds; and locally to the increase of the natural enemies of the bird.

Mr. Bergstrom's record for March 8, 1925, is early. We noted it on March 27, 30, and 31, 1926, near Linesville. Mr. Langdon first noted it on April 9, 1925, although I feel certain this was not an arrival date. When we came to Pymatuning for the first time on April 27, 1922, Woodcocks were present in full numbers, and on the beautiful evenings were bleating and whistling in a dozen places. The antics of courtship ceased more or less by May 6. One male was shot on May 5 at Crystal Lake. The transient individuals were gone by the first of May. Nesting starts so early that we were unsuccessful in finding a nest with eggs, although we carefully searched the likely spots about Crystal and Lower Lakes. Single birds were seen daily; probably we often passed incubating females, which refused to leave their nests.

On May 9, 1925, Mr. Herbert Borrell of Meadville observed young birds partly grown and able to fly somewhat with their parents. We found no young birds until May 29, 1923. These were seen at night on a little knoll near Crystal Lake. The family group made off with considerable commotion. They had doubtless been feeding in the moonlight. On June 16, 1923, another family of young were seen four miles north of Hartstown. Mr. Kirkpatrick has several juvenal specimens taken in mid-summer near Meadville.

In the fall we have numerous records for August and September, but the flight of transients doubtless does not occur until late September or October: September 18, 1925, two, Lower Lake (Sutton); October 24, 1903, Meadville (Kirkpatrick); October 20, 1911, female taken, Conneaut Lake (Welshons); October 29 and November 11, 1911, Meadville (Kirkpatrick); and last, November 28, 1912, a male taken, Conneaut Lake (Welshons).

The Woodcock suffers from many enemies and, unless federal protection is given it, is certainly doomed to extermination. At Pymatuning in addition to the predatory birds and mammals including

wandering dogs, house-cats, and *man*, there is also a menace in the presence of telephone wires. During their courtship flights the birds often strike these wires, which, suspended as they are only a short way from the ground, are in the direct path of the rising performers. On the morning of May 28, 1922, I found two birds dead from broken necks under the wires near Crystal Lake. These two birds were found about one hundred yards apart. Both were males.

63. *Capella gallinago delicata* (Ord). WILSON'S SNIPE (230).
(Pl. X, fig. 1).

A common and fairly regular migrant both in spring and fall, and irregularly and locally common as a summer resident, known to have nested at Pymatuning Swamp in at least three marshy areas: in a little marsh west of Hartstown; at Meadville Junction Pond; and in Conneaut Marsh. It has been found at Erie as a summer resident at several points south of the lake shore (Todd, *Birds of Erie and Presque Isle*, 1904, 537) but it has remained for us to collect the first set of eggs upon which an absolute breeding record may be founded.

In its spring migration it often reaches this latitude before the end of March. Thus Mr. Bergstrom recorded one at Shermansville on March 8, 1925; and Mr. Kirkpatrick among his numerous records for Meadville has two during March: March 26, 1903, and March 28, 1908. Mr. Bergstrom's record is so early that it suggests the possibility of occasional winter residence. This may, indeed, be even probable, since Mr. Thomas D. Burleigh has known the birds to winter in Centre County. However, these winter residents and earlier transients doubtless pass on to the northward to nest. The height of the movement occurs in April: April 5, 1901, French Creek (Kirkpatrick); April 6, 1910, female taken, Conneaut Lake (Welshons); April 9 and 10, 1925, Hartstown (Langdon). Courting commences by the middle of April. On April 27, 1922, when we first visited the region, hundreds of snipes were everywhere in evidence, most of them courting. The details of their antics, and a discussion of the nesting sites, etc., have appeared in a separate paper (Sutton, *Wilson Bulletin*, Vol. XXXV, December, 1923, 191-202). According to our dates for nests and eggs, many transient birds must still be present when the summer residents are laying and incubating. The antics of courtship virtually cease by the end of the first week in May.

Mr. George Wilson, a farmer who lives near Hartstown, has known

that snipes nested in a little marsh on his property for years. On May 4, 1922, we found the first set of four eggs near Hartstown. During 1922 probably a dozen pairs nested in the vicinity of the southern extremity of Pymatuning Swamp. Nests with eggs were found on May 15, 16, and 17, during 1923. Nests with young were found on May 17, 1922, and May 29, 1923. The latter nest was placed deep in the cat-tails, a unique situation. On May 1, 1925, a nest and four eggs were found in a small tussock of grass near Geneva on the farm of Mr. W. B. Adsit. They then thought the nest to be that of a Killdeer. When I examined the nest on May 15 there were but a few tiny remains of egg-shells, but from the location of the nest and from the color of the bits of shell I am certain it was the nest of a snipe. For one thing, to the best of my knowledge, the Killdeer never exclusively uses grass in the construction of its nest.

During 1924 no nesting snipes were located. After studying this species as a breeding bird for several seasons I regard it as irregular and extremely susceptible to local conditions. If the marsh country is dry, no snipes are to be found. Nests were often placed in clumps of vegetation, which were surrounded by comparatively deep water. If spring burning of the cat-tails occurs (as it did in 1925) the snipes may leave altogether. If the season is dry, the birds may occur in limited numbers, or be entirely absent. They definitely depend upon a partially open marsh, preferably with tussocks of moss, grass, ferns, and half-sunken logs, upon which to build their nests.

The nine nests examined were in every case neatly built, and well cupped. Often fern sheaths were used in the lining. The young were very agile and extremely difficult to catch. The parent birds apparently tried to lead their young to a drier region after they had become strong.

On July 1, 1927 ten Snipes were recorded along the Shenango River near Espyville. In the fall the transients are believed to arrive in late August and early September: August 25, 1925, Crystal Lake (Sutton); September 16, 1909, and September 25, 1911, Meadville (Kirkpatrick). They occur until the middle of October: October 11, 1906, French Creek (Kirkpatrick); and occasionally even later.

Mr. Edgar Huidekoper found a nest of Wilson's Snipe at Conneaut Marsh on May 13, 1875, containing four eggs of a "grayish olive color" more or less spotted with umber brown. Some of the details of the finding were related to Mr. Kirkpatrick some years ago as follows:

"I was snipe-shooting at the time, a little west of the Erie Railroad track near Geneva. My dog came to a point among a thick growth of marsh-grass. The bird was flushed, shot, and afterwards retrieved by the dog. I went on up the marsh in quest of more birds, coming back the same way. The dog came to another point in exactly the same spot he had on the way up. I thought this very strange and went to investigate. I found the nest of the bird I had shot a short time before. It was built in a tussock of marsh-grass and was composed entirely of dried grasses."

Limnodromus griseus griseus (Gmelin). DOWITCHER (231).

Although we have no record for this species it should occasionally occur as a rare migrant. It has been taken at least twice at Erie by Mr. Bacon (Todd, *Birds of Erie and Presque Isle*, 1904, 538).

Micropalama himantopus (Bonaparte). STILT SANDPIPER (233).

While we have not yet found this species in the present region, it doubtless occurs irregularly at least in the fall, in view of its status at Erie, where several specimens have been taken (Todd, *Birds of Erie and Presque Isle*, 1904, 528). It is difficult for the amateur to distinguish this species from the Lesser Yellow-legs.

64. **Calidris canutus rufus** (Mathews). KNOT; ROBIN SNIPE (234).

Regarded as rare and irregular at Erie (Todd, *Birds of Erie and Presque Isle*, 1904, 538), the Knot is certainly one of the rarest of the shore-birds which visit the Pymatuning region. When it does occur, it probably wanders over from Lake Erie, or is driven across by storms. Mr. Kirkpatrick secured one at Conneaut Marsh on October 11, 1906. Mr. Welshons secured a male on November 22 and a female on November 28, 1912, at Conneaut Lake. It would seem that the occurrence of this species is more probable in fall than in spring.

Arquatella maritima maritima (Brünnich). PURPLE SANDPIPER (235).

Although Mr. Todd gives this species full rank in his list for Erie (*Birds of Erie and Presque Isle*, 1904, 539) on the basis of Warren's statement that Sennett mentioned it as a straggler there (*Birds of Pennsylvania*, 1890, 84), it seems to me utterly improbable that this species should occur here, or at Erie either, for that matter, in view of the absence of rocky headlands, which this species is known to frequent.

65. **Pisobia maculata** (Vieillot). PECTORAL SANDPIPER (239).

Our spring records for this species are fully as numerous as those for the fall, in spite of the fact that Mr. Samuel E. Bacon regarded it

as much more abundant in the fall in the vicinity of Erie (Todd, *Birds of Erie and Presque Isle*, 1904, 539). Mr. Kirkpatrick took specimens along French Creek near Meadville on April 13, 1901, April 15, 1895, and April 24, 1909. Mr. Langdon saw about twenty individuals near Geneva on May 13, 1925. I saw a single bird near Geneva on May 15, 1925, which was in company with a Greater Yellow-legs, a Lesser Yellow-legs, two Semipalmated Sandpipers, five Least Sandpipers, and a Semipalmated Plover. Mr. Langdon secured male and female specimens from flocks, which he saw south of Conneaut Lake along the puddles in muddy fields, on May 28 and 29, and June 18, 1926.

Mr. Bergstrom furnishes our earliest records for the fall. On September 6, 1926, he saw one on the golf-course at Conneaut Lake Park; he also saw three along Conneaut Marsh on September 16, and he and Mr. Welshons took one male to make identification certain. On September 20, 1908, and September 25, 1911, Mr. Kirkpatrick noted several in the meadows bordering French Creek, south of Meadville. These dates probably mark the end of the fall migration, which doubtless is most evident in August and early September. Such species as this almost never occur at Conneaut Lake, because there are no sand-bars, beaches, or mud-flats. Similarly the wooded Pymatuning is altogether unsuitable as a feeding-ground. Only in the flat fields, where an occasional mud-puddle occurs as a result of recent rains, do these shore-birds regularly stop. There is a mounted specimen in the Rufus C. Adams collection at the Oakland Beach Hotel.

Mr. Kirkpatrick writes concerning the birds seen on April 13, 1901: "Some twenty-five or thirty of these sandpipers were seen on the muddy shore of a pond that lay in the open meadow bordering French Creek south of Meadville. The sun was just rising above the hills, giving promise of a warm spring day. The birds, perhaps having arrived during the night, were busily engaged in taking an early morning bath, dressing and preening their plumage and running about on the muddy shore. As the bright sunlight fell upon the scene it painted a picture sparkling with colors which I shall never forget."

66. **Pisobia fuscicollis** (Vieillot). WHITE-RUMPED SANDPIPER (240).

At Erie Mr. Todd found this to be one of the rarer shore-birds (*Birds of Erie and Presque Isle*, 1904, 540). Our only records for the present region are furnished by Mr. Langdon, who took two females

and a male on May 26, and a male on May 30, 1926, from a fair-sized flock found near a muddy puddle in a field a few miles south of Conneaut Lake.

Pisobia bairdi (Coues). BAIRD'S SANDPIPER (241).

Apparently a "moderately common and regular" migrant at Erie according to Mr. Todd (*Birds of Erie and Presque Isle*, 1904, 540). There is no reason that this species should not occasionally occur in suitable spots in the present region. At Erie it has not been seen in flocks, however.

67. ***Pisobia minutilla*** (Vieillot). LEAST SANDPIPER (242).

A rather rare and irregular migrant, which occurs only along the muddy pools near the roads and in the open fields, and practically never at any of the larger lakes of the region. On May 13, 1922, I took a male specimen from a tiny puddle near Hartstown. On May 13, 1925, Mr. Langdon saw a rather large flock in a wide field north of Geneva. On May 15, 1925, I observed part of this same flock (presumably) and noted their diagnostic characters perfectly. On May 25, 1925, Mr. Langdon forwarded a specimen which he had taken from a little pool south of Conneaut Lake. This female bird, although in full plumage, was very dull and faded in appearance. Most of the feathers of the upper parts had altogether lost their rusty edgings. The marginal coloring of the feathers was more pronounced on the head than elsewhere. On May 26, 1926, Mr. Langdon took a female at a puddle south of the Lake; he also recorded the species as late as May 29 and June 2, 1925, at Conneaut Marsh, and noted them during June and July, 1926.

The southward migration starts in mid summer. Mr. Kirkpatrick took one near Meadville on July 25, 1895. Mr. Langdon recorded one at Sugar Lake on August 18, 1925. The latest date we have is September 7, 1908, at a pool along French Creek, two miles south of Meadville.

68. ***Pelidna alpina pacifica*** Coues. RED-BACKED SANDPIPER (243a).

Usually a rather rare and irregular migrant, occurring only at puddles in the fields and along the margins of the streams, and not along the lake-shores. We have several spring records. We saw one in handsome full plumage on May 15, 1925, at a little puddle north of Geneva, in Conneaut Marsh. The bird was very tame. When a Greater Yellow-legs flew off uttering startled cries the Red-back

darted after it, and neither of them returned, so far as we know. Mr. Langdon again recorded one at the same spot on May 23, 1925. In 1926 Mr. Langdon found them common about the mud-puddles south of Conneaut Lake from May 25 to 29, and took four specimens in full plumage.

Mr. Kirkpatrick took a male along French Creek about two miles south of Meadville on October 10, 1908. Mr. Welshons and Mr. Bergstrom took a male from a flock of three seen at Conneaut Marsh on October 18, 1926. It is surprising, in view of our experience, that Mr. Todd found this species to be a common transient visitor in the fall at Erie, but rare in spring (*Birds of Erie and Presque Isle*, 1904, 541).

69. **Ereunetes pusillus** (Linnæus). SEMIPALMATED SANDPIPER (246).

A migrant of occasional occurrence, apparently much commoner in the fall than in the spring. I saw two birds at a puddle north of Geneva, in Conneaut Marsh, on May 15, 1925. Least Sandpipers were also present, so that identification was comparatively easy and certain. Mr. Langdon found Semipalmated Sandpipers abundant about the mud-puddles south of Conneaut Lake from May 26 to June 1, 1926. He took a male and female on May 26 and two males on May 30.

In the fall the species probably arrives in the latter part of July. However, I did not see it until August 24, 1925, when one was recorded near Hartstown. On September 5 and 7, 1908, Mr. Kirkpatrick took specimens near Meadville. On September 8 and 14, 1925, I saw a single individual at Crystal Lake. Our latest record is September 16, 1909, French Creek, two miles south of Meadville (Kirkpatrick).

Ereunetes mauri Cabanis. WESTERN SANDPIPER (247).

In view of the great similarity of the small sandpipers it is necessary to watch closely for this species, which should occasionally occur. Any Semipalmated Sandpiper with an unusually long bill is likely to be of this species. Mr. Todd did not find it at Erie (*Birds of Erie and Presque Isle*, 1904, 542).

70. **Crocethia alba** (Pallas). SANDERLING (248).

Although Mr. Todd regarded the Sanderling as the most abundant of the shore-birds in the fall at Erie (*Birds of Erie and Presque Isle*,

1904, 542) it is apparently very rare here. We have but one certain record, although other doubtful records may refer to this species. Mr. Welshons took an adult male and female at Conneaut Lake on November 1, 1909. Probably this is one of the species, which make a long flight directly southward or southeastward from Lake Erie, so that it does not as a rule touch the Pymatuning region.

71. **Limosa fedoa** (Linnæus). MARBLED GODWIT (249).

A very rare transient visitant, perhaps best regarded as a straggler. Warren states: "Mr. George B. Sennett informs me stragglers are occasionally taken in Crawford and Erie Counties" (*Birds of Pennsylvania*. 1890, 88). The localities in Crawford County to which this statement refers are apparently unknown, although it is believed that at least one of our two records is not covered by it.

The late Mr. William G. Sargent of Meadville, took a specimen at Conneaut Marsh in the spring late in the '70's, just about the time Mr. Sennett took up his residence at Meadville. Mr. Sargent had the bird mounted, and it was in his possession until the time of his death in 1898. It then came into the hands of Mr. Frank R. Shryhock, also of this city, and after Mr. Shryhock's death several years ago all trace of it was lost. Mr. Kirkpatrick, who has furnished me with the above information, is of the opinion that Warren's statement, quoted above, refers principally to this specimen.

Mayor John E. Reynold of Meadville kindly presented me with a beautiful mounted specimen, which he took at Edinboro Lake, in southern Erie County on October 21, 1898.

Limosa hæmastica (Linnæus). HUDSONIAN GODWIT (251).

This species may occur as a rare migrant both in spring and fall although Mr. Todd did not find it at Erie (*Birds of Erie and Presque Isle*, 1904, 543). It is doubtless rarer than it was formerly.

72. **Totanus melanoleucus** (Gmelin). GREATER YELLOW-LEGS (254).

A fairly common migrant both in spring and fall, but never so common as the Lesser Yellow-legs, with which it often associates. In spring Mr. Kirkpatrick has noted it as early as March 28, 1901, near Meadville. His later dates, in order, are as follows: April 13, 1901, French Creek, south of Meadville; April 24, 1909, Conneaut Lake; April 26, 1895, French Creek; May 2, 1896, Meadville. Mr. Welshons took a male on May 3, 1911, at Conneaut Lake. I secured

one at a pond three miles west of Linesville on May 4, 1922. Mr. Langdon took a handsomely mottled male at the outlet of Conneaut Lake on May 13, 1925, where he saw several. On May 25, 1922, we saw one near Hartstown. On May 29 and June 2, 1925, Mr. Langdon saw single individuals near the outlet of Conneaut Lake at a pond north of Geneva in Conneaut Marsh.

In the fall Mr. Bergstrom has noted this species near Shermansville as early as August 10, 1924. In 1925 we saw it as late as September 10 at Crystal Lake; but Mr. Kirkpatrick took one along French Creek on September 25, 1911. Mr. Langdon has noted it at Conneaut Lake on the remarkably late date of October 31, 1926.

73. **Totanus flavipes** (Gmelin). LESSER YELLOW-LEGS (255).

A common and generally distributed transient visitant, usually commoner than the Greater Yellow-legs, with which it is often seen. Both species may occur along the shores of any of the lakes, although there are very poor feeding flats or muddy areas anywhere upon which they may rest. In this particular they differ from most of the shore-birds which may fly over or about the lakes, but never stop for food or rest because of the abruptness of the shores and the thick vegetation.

Mr. Kirkpatrick recorded this species as early as April 26, 1895, near Meadville. I shot a male on May 8, 1922, in a field two miles north of Hartstown, and saw another on the following day. Mr. Langdon secured a male in mottled plumage on May 11, 1925, at the outlet of Conneaut Lake. The testes of this specimen were small. On May 13, 1925, Mr. Langdon took another specimen, a female, from a large, loose flock, which were observed at a muddy spot in a field north of Geneva. This observer recorded it as late as May 29 and June 2, 1925, at the mouth of the outlet of Conneaut Lake, along French Creek.

In the fall Mr. Bergstrom first noted it at Pymatuning Swamp and at Conneaut Lake on August 14, 1924. Mr. Kirkpatrick took a specimen on September 25, 1911, near Meadville. Mr. Welshons noted one at the Lake on October 3, 1926. Mr. Kirkpatrick recorded a single bird on the extremely late date of December 6, 1920, along French Creek near Meadville.

74. *Tringa solitaria solitaria* Wilson. SOLITARY SANDPIPER (256).

A common and regular migrant, which sometimes occurs in summer, as it also has been found to occur at Erie (Todd, *Birds of Erie and Presque Isle*, 1904, 545). Often the Solitary Sandpiper and the Greater and Lesser Yellow-legs will be found together at the same marshy spots. Warren states that both Mr. Sennett and Mr. Kirkpatrick regarded it as an occasional mid-summer bird in Crawford County (*Birds of Pennsylvania*, 1890, 90) but he does not present any actual dates nor mention any indications whatever of its breeding.

Mr. Kirkpatrick has noted it at Meadville as early as April 25, 1896, and April 28, 1900. In early May it is common: May 2, 1901, French Creek (Kirkpatrick); May 4, 1922, Crystal Lake (Sutton); May 12, 1925, two specimens taken, male and female, Conneaut Lake (Langdon); May 15, 1923, Lower Lake (Sutton). Transients are present as late as April 28, 1900, Meadville (Kirkpatrick); May 29, 1925, Conneaut Marsh (Langdon); and May 31, 1894, Meadville (Kirkpatrick).

The following may fairly be regarded as mid-summer records: June 2, 1925, Conneaut Marsh (Langdon); June 6, 1922, Crystal Lake (Sutton); June 28, 1926, Conneaut Lake (Langdon); and July 29, 1897, Meadville (Kirkpatrick). While we do not yet have any proof that these summering individuals nest, and while no obviously juvenal birds have yet been collected, it is highly interesting to note that two birds observed from May 8 to 19, 1922, at Pymatuning Swamp, were plainly mated, and apparently searching for a nesting site. One bird was much more demonstrative in this respect than the other. It is merely conjectural that the more busily occupied bird was the female. The actions of this bird were remarkable. A dozen times at least she was seen to enter the deserted nest of a Hairy Woodpecker at least fifty feet from the ground, and to perch nervously and lightly on the tips of the nearby dead stubs. She was plainly excited, though she did not cry out. Later she entered another hole, and although I finally climbed to the first hole I found no sign of eggs or young. After climbing this stub I did not see the birds again.

In the fall it moves southward early. Two immature birds were seen near Hartstown from August 28 to September 18, 1925. They were observed daily. An adult male was taken on August 31, 1925, near Crystal Lake, along the southern shore. Mr. Kirkpatrick's

Meadville records for the fall are as follows: August 30, 1922; September 25, 1894. Most of the birds are gone, however, by the middle of September. Mr. Welshons feels certain that he noted this species at Conneaut Lake on the very late date of October 6, 1926.

Catoptrophorus semipalmatus semipalmatus (Gmelin). WILLET (258).

It would seem that any Willet found in the present region should be of this form, and Mr. Samuel E. Bacon is known to have taken a pair at Erie on April 24, 1902 (Todd, *Birds of Erie and Presque Isle*, 1904, 545). However the eastern race has become very rare in the northern part of its range, whereas the Western Willet, breeding rather commonly as it does in Manitoba, apparently swings to the eastward in migrating south and often appears in the region of the Atlantic coast. Warren (*Birds of Pennsylvania*, 1890, 92) mentions the occurrence of the Eastern Willet in southeastern Pennsylvania, and Mr. Eaton (*Birds of New York*, 1910, 329) lists several records, one for Chautauqua Lake.

75. **Catoptrophorus semipalmatus inornatus** (Brewster).

WESTERN WILLET (258a).

A very rare transient, perhaps best designated as a straggler. Mr. Welshons took a male in full plumage on May 12, 1911, at Conneaut Lake. No others were seen. I am indebted to Dr. Harry C. Oberholser of the Bureau of the Biological Survey, U. S. Department of Agriculture, for identification of this specimen.

Warren does not mention the present form in his treatise (*Birds of Pennsylvania*, 1890) although he included the Eastern Willet. Mr. Eaton (*Birds of New York*, 1910, 330) includes the form hypothetically. Mr. Todd did not record it at Erie (*Birds of Erie and Presque Isle*, 1904); but the capture of the present specimen tends to substantiate the belief, which is held by some scientists, that certain western birds often, if not habitually, migrate southward, or southeastward along the Atlantic coast.

The present specimen is in a portion of Mr. Welshons's Pittsburgh collection which is not on exhibition.

76. **Bartramia longicauda** (Bechstein).

BARTRAMIAN SANDPIPER; UPLAND PLOVER (261).

A rather rare transient, which probably does not move much farther north to nest; a rare and very local summer resident, known to have nested at only four points in the immediate vicinity of Pymatuning, although it nests regularly in certain fields near Greenville, Mercer

County, to the south, according to Messrs. Fred and Louis Homer, who are well acquainted with the bird's movements and status there.

According to Mr. William Wade, a farmer who lives about three miles west of Hartstown, the Upland Plover arrives about April 12 as a rule. In 1922, 1923, and 1925 we saw it first on May 16, although this is not offered as a date of arrival, since the birds had eggs or young at the time. On June 2, 1922, parent birds and four young were seen in the wide fields west of Hartstown, where, under ecological conditions very different from those of Pymatuning proper, the birds nested. These open fields are instantly reminiscent of the Great Plains, and doubtless this species has comparatively recently arrived in northwestern Pennsylvania, subsequent to the clearing of the land.

The handsome birds were nesting far apart; but we located at least three breeding pairs. Mr. Langdon noted one near Conneaut Lake on May 29, 1926, and another on June 27. Mr. Bergstrom saw one near Shermansville on June 15, 1927. In the collection of Mr. J. G. Crumb is a single egg of this species taken about four miles west of Linesville during the spring of a former year (about 1900). We saw one bird flying across Pymatuning on August 22, 1925. It seems that prior to 1926 this species had not been seen or heard of east of Pymatuning Swamp.

Tryngites subruficollis (Vieillot). BUFF-BREASTED SANDPIPER (262).

While this species may have been common formerly, it is today one of the rarest members of its family. Mr. Todd did not find it at Erie, where it should occur, if anywhere in the region. It is to be looked for as a migrant, although it has been known to breed near the Ontario shore of Lake Erie (McIlwraith, *Birds of Ontario*, 1894, 156-157).

77. **Actitis macularia** (Linnæus). SPOTTED SANDPIPER (263).

Abundant as a transient, and common, but very local, as a summer resident, occurring much more commonly at Conneaut Lake than at Pymatuning. While it is occasionally seen at Crystal or Lower Lakes, it is usually not found in these situations, because the shores are not satisfactory as feeding or nesting-grounds. At Conneaut Lake, however, along the narrow sand or gravel margins, the little "tip-up" is often seen. Mr. Kirkpatrick has seen it at Meadville as early as March 24, 1898. It does not, however, usually appear until the middle of April: April 18, 1901, French Creek (Kirkpatrick);

April 26, 1913, Meadville (First); April 27, 1925, Conneaut Lake (Langdon). It is abundant during early May and by May 7 all the local summer residents are mated and nesting. On July 1, 1927, we saw several along the Shenango River near Espyville.

Mr. Kirkpatrick found a nest with three eggs near Meadville on the exceptionally early date of April 20, 1898. As a rule eggs are not found until later: May 3, 1897, French Creek (Kirkpatrick); May 8, 1914, Meadville (First); May 11, 1898, Meadville (Kirkpatrick); May 29, 1922, small stream two miles north of Hartstown (Sutton); June 5, 1897, Meadville (Kirkpatrick). The last-named nest was built within four feet of a railroad track over which trains were regularly running.

In the fall it is virtually impossible to distinguish the transient birds, which have come in from farther north. However, such fall records as could well apply to transients follow: August 30, 1925, Crystal Lake (Sutton); September 25, and October 16, 1909, Meadville (Kirkpatrick). On May 19, 1922, a male bird, which had been struck by an automobile, was picked up dead along the road between Hartstown and Conneaut Lake.

Numenius americanus americanus Bechstein. LONG-BILLED CURLEW (264).

May have occurred formerly as a migrant, and even as a nesting species with some regularity, but very rare at the present time, and not found at Erie by Mr. Todd (*Birds of Erie and Presque Isle*, 1904, 547).

78. **Phæopus hudsonicus** (Latham). HUDSONIAN CURLEW (265).

A rare transient, not to be considered exactly as a straggler, since its migration route should pass through the present region. Mr. Welshons took a male specimen at Conneaut Lake on April 17, 1912. Mr. Bacon recorded it at Erie twice in the fall, and two other records are known from the region of Erie (Todd, *Birds of Erie and Presque Isle*, 1904, 547).

Numenius borealis (J. R. Forster). ESKIMO CURLEW (266).

Considered by Mr. Todd as a "very rare fall transient" at the time of the writing of his Erie report (*Birds of Erie and Presque Isle*, 1904, 548). Today it is doubtless much rarer, since it is now considered on the verge of extinction. It formerly occurred in the present region, doubtless as a fairly regular migrant.

79. **Squatarola squatarola cynosuræ** Thayer and Bangs.

BLACK-BELLIED PLOVER (270).

A rare and irregular spring and fall migrant, which doubtless wanders over from the shores of Lake Erie, where it is common, especially

in the fall (Todd, *Birds of Erie and Presque Isle*, 1904, 548). It is interesting to note that, while Mr. Todd mentions no certain spring records for Erie, we have two for the present region. It is probable in this connection that flocking is not so noticeable in the spring as in the fall and that the northward moving birds occur much more widely and in fewer numbers and do not remain for long even in desirable feeding places, unless there is inclement weather. Mr. Welshons took a male and two females in high plumage on April 6, 1914 at Conneaut Lake. Mr. Kirkpatrick saw one in a freshly plowed field two miles south of Meadville on May 1, 1898.

In the fall it is hardly known in the present region. This fact agrees admirably with my theory that many species of birds which depart from Lake Erie toward the south do so in great haste, and are not seen between the Lake and their next stopping-place, which might well be in the vicinity of Cobb's Island, Virginia, for instance, or even farther south. Mr. Welshons and Mr. Bergstrom saw one at Conneaut Marsh on September 5, 1926. I saw a lone adult in handsome plumage on September 8, 1925, flying low over Crystal Lake. This bird was plainly lost from its flock, and called loudly until it disappeared flying in the direction of Conneaut Lake. I do not think that this bird was blown in by a storm, since the weather had been fine for several days; the morning was very hazy, however.

80. **Pluvialis dominica dominica** (Müller). GOLDEN PLOVER (272).

At Erie Mr. Bacon regarded this plover as considerably commoner than the Black-bellied species (Todd, *Birds of Erie and Presque Isle*, 1904, 548): in the present region it is of course, to be looked for only in the fall, since it follows the Mississippi River valley in moving northward in the spring. There is a specimen in Mr. Welshons's Pittsburgh collection, which was taken near Conneaut Lake during the year 1912. The date of capture, according to Mr. Welshons, was March 17. Mr. Welshons definitely remembers the circumstances attending the taking of the bird, and is certain that there is no error in the date. The bird was evidently a straggler; possibly it had been maimed during the preceding gunning season along the southern shore of Lake Erie.

Mr. Welshons and Mr. Bergstrom had the good fortune to see two Golden Plover at Conneaut Marsh on September 16, 1926. One of these, an immature female, was secured.

81. *Oxyechus vociferus vociferus* (Linnæus). KILLDEER (273).

Abundant as a migrant, common as a summer resident, and occasional in winter, when it may occur irregularly in rather large flocks in the low, open fields where it feeds. Mr. Bergstrom recorded it at Shermansville as early as March 8, 1925, and Mr. Langdon saw a small flock only a few days later on March 12 at Conneaut Lake. Mr. Kirkpatrick's first record for Meadville is March 16, 1908. Mr. Welshons took a specimen at Conneaut Lake on March 20, 1913. By latter April and early May the birds are mated and arranging their nests. Mr. Kirkpatrick found a nest and three eggs near Meadville on April 20, 1898. We found a female building on May 6, 1922, near Hartstown. Other nesting dates follow: May 11, 1898, French Creek (Kirkpatrick); May 16, 1925, four young, Conneaut Marsh (Langdon); May 25, 1922, female and four young, Hartstown (Sutton); May 28, 1922, nest and four eggs collected, Crystal Lake (Sutton). During July the family flocks remain separate in the fields where the young were reared; but by early September the flocking instinct asserts itself and great groups of the strikingly colored creatures congregate in open or plowed fields, or near shallow water, if there be any. Our actual fall records are few, but all observers agree that it is often seen throughout October and early November, and Messrs. Langdon and Bergstrom have noted it at different times in winter.

The nest found on May 28, 1922 (possibly a second set of eggs), was a beautiful structure in spite of the fact that Killdeers are reputed not to build a nest. Bits of burnt wood and small pebbles had been selected evidently with the greatest care, and were placed in the nest with the largest pieces noticeably at the outer edge, and the smaller ones under the eggs. There was also a suggestion of pavement about the nest, this being made of small stones of remarkably similar size, shape, and color. The broad leaves of a marsh marigold nearby offered this nest but slight protection.

82. *Charadrius semipalmatus* Bonaparte.

SEMIPALMATED PLOVER (274).

A rather rare migrant, apparently, though not certainly, commoner in the spring than in the fall. It doubtless wanders over from Lake Erie, where it is abundant as a transient visitant (Todd, *Birds of Erie and Presque Isle*, 1904, 550). In 1925 these little plovers were seen

three times in the spring: on May 15 an adult male was observed under excellent circumstances at a little puddle north of Geneva; on May 23 Mr. Langdon saw a flock of about ten near the southern extremity of Pymatuning; and on May 29 Mr. Langdon saw one at Conneaut Lake. Mr. Langdon took two females on May 26, 1926, from a muddy field south of Conneaut Lake. He noted them as fairly abundant there from May 25 to 29.

In the fall they move southward in August and September: August 24, 1925, Crystal Lake (Sutton); September 7, 1908, male collected two miles south of Meadville along French Creek (Kirkpatrick); September 8, 1925, one seen with a large flock of Killdeers, flying above the water, Crystal Lake (Sutton); September 14, 1925, Lower Lake (Sutton).

83. **Charadrius melodus** Ord. PIPING PLOVER (277).

A very rare transient visitant, and possibly an occasional summer visitant from Lake Erie, where it is known to nest (Todd, *Birds of Erie and Presque Isle*, 1904, 550). Mr. Kirkpatrick took the only local specimen of which we are aware along French Creek about two miles south of Meadville on September 7, 1908. On this date he also recorded and collected a Semipalmated Plover.

84. **Arenaria interpres morinella** (Linnæus).

RUDDY TURNSTONE (283).

A very rare transient, which doubtless wanders over from Lake Erie, where Mr. Todd did not find it common, though it was apparently fairly regular in appearance (*Birds of Erie and Presque Isle*, 1904, 550-551). Mr. Kirkpatrick has furnished us with our earliest record. He took an adult male on May 16, 1899, along the extreme eastern shore of Conneaut Lake. Mr. Langdon had the good fortune to secure a very handsome pair on May 26, 1926, from a muddy flat south of Conneaut Lake. He noted other individuals on May 25 and 28.

Such species as this, whose routes of migration should include the present area, are not, as I see it, to be considered as stragglers, this term being properly applied rather to those birds, whether rare or common in their normal range, which are recorded in a region which is quite outside either their known summer or winter range, or their known paths of migration. Therefore the present species is to be

regarded not as a straggler, as the extreme paucity of records might tend to indicate, but rather as a rare migrant, which should occur regularly, even though in small numbers. The Ruddy Turnstone, like many other shore-birds, probably leaves the southern shores of Lake Erie in haste in the fall and flies over the Pymatuning region without stopping. If this be true, the absence of fall records is explainable. In returning in the spring, however, the birds move northward more gradually, and as a result may be looked for with some regularity.

***Phasianus colchicus torquatus* Gmelin. RING-NECKED PHEASANT.**

Ring-necks were first released as game-birds in Pennsylvania in 1915. During the last four years approximately 1400 individuals have been liberated in Crawford County, and a fair proportion of this number were placed in or about the borders of Pymatuning Swamp and near Conneaut Lake. This Asiatic form has adapted itself admirably to conditions in the present region. While it has won for itself the reputation of a carnivore, we find that the reports concerning its killing of young rabbits, Bobwhites, and Ruffed Grouse, and its devouring of eggs, are almost altogether without foundation.

It fares well in winter in the present region, and seems to find the thicker portions of the Swamp admirably equipped with food and shelter for its use. On February 11, 1927 we noted many Ring-neck tracks in the snow. On June 30, 1927 I observed a female and several half-grown young near Hartstown. On July 1, 1927, a farmer brought Mr. Bergstrom a set of seven much incubated eggs, which he had found in a mown field near Shermansville. The female bird, which had refused to leave her nest, had been injured by the knives of the cutting machine. On July 2 we saw a female with one fully developed young about two miles northwest of Hartstown.

The strange explosive crow of the cock in spring may puzzle the occasional student of birds in this region. This cry might be written "Bok-bok".

85. *Colinus virginianus virginianus* (Linnæus). BOB-WHITE (289).

An irregularly common permanent resident, which prior to 1905 was considered common. Mr. Todd recorded it as numerous near Linesville on June 16, 1897. After 1905 it gradually became rarer, until in 1919 it was quite scarce, and entirely absent from some sections. During the last four or five years, however, it has become much commoner, due to the restocking activities of the State Game Commission. While none of these birds was placed directly in Crawford County, 486 male and female birds were placed in Venango, Erie, and Mercer Counties, and many of these were liberated in townships directly bordering upon Pymatuning Swamp, so that spreading out was easy. Thus a dozen birds were placed in each of the following townships of

Mercer County: West Salem, Sugar Grove, Hempfield, Greene, and Sandy Creek. These birds were brought in from Kansas, and were smaller and slightly paler than our native *virginianus*. The birds now present, while admittedly hybrids, seem to be thriving, so that Bob-whites are now fairly abundant, particularly in parts of Pymatuning Swamp, where there is excellent winter food and cover.

On June 1, 1924, I saw three large coveys. During February, 1925, several large flocks were noted. Local residents of Hartstown and the vicinity had been feeding them. So far as I can determine there are no local seasonal movements of this species. They are more noticeable in summer, because of their loud whistle, but of recent years they have been noted frequently in winter also. As a rule nests with full sets of eggs are found in May and early June. Mr. Kirkpatrick found one nest in a meadow near Meadville on July 14, 1906, which contained fourteen eggs. This nest was exposed to view with the mowing of the grass and was deserted by the parent birds. Mr. Langdon observed a nest and eleven eggs (at the point of hatching) in a cemetery near Shaw's Landing on August 25, 1925. From June 28 to July 2, 1927 we noted several mated pairs, but no young birds. With proper protection Bob-whites should become abundant throughout the drier parts of the Pymatuning region.

86. **Bonasa umbellus umbellus** (Linnæus). RUFFED GROUSE (300).

A fairly common permanent resident, subject to the cycles of abundance and scarcity for which the species is well known. It is most abundant in the drier portions of Pymatuning Swamp, where in 1922 and again in 1925 it was found in considerable numbers. It is rather rare in the upper woodlands, save where locally reared families succeed in remaining together.

Drumming may occur throughout the year and at virtually any time, day or night, but it was noted chiefly on warm mornings during April and May. Mr. Kirkpatrick found a nest and thirteen eggs on April 30, 1896, near Meadville. All of our nests were found in early May: May 8, 1922, eleven eggs, a mile north of Hartstown (John G. Thomas); May 16, 1925, nine eggs, about three miles north of Hartstown in a beautifully sheltered spot at the base of a great hemlock; May 21, 1922, seven eggs, near Crystal Lake; May 25, 1922, six eggs, near Lower Lake. Mr. Kirkpatrick found a nest with thirteen eggs on May 12, 1897. Dr. O. E. Jennings and his party located two nests

on June 2, 1923, while they were searching portions of the sphagnum bog near Hartstown. One of these nests was sheltered by leaves of skunk cabbage. This sphagnum-tamarack association is a favorite haunt of the grouse, not only in the nesting season, but in winter. The black alders also furnish good cover. Mr. Todd saw a family of half grown young near Dollar Lake on June 16, 1898. On August 22, 1925, Mr. Bergstrom saw a family of young, well able to fly, near Shermansville. The spring season of 1924 was severe, and due to its protracted cold spells and disagreeable variations of temperature, many grouse eggs did not hatch, and numerous young birds died as a result of exposure and lack of proper food.

Examination of stomachs of grouse killed in Pymatuning shows that during the fall and winter rose-hips, alder twigs, leaves and twigs of aspen, leaves and stems of ground-ivy, buds of aspen, beech, and other trees, and sumac-seeds have been eaten. In spring the crops are sometimes completely filled with catkins from the flowering shrubs and trees.

Locally the chief enemy of this splendid game-bird is the Red Fox, which flourishes at Pymatuning. On February 19, 1925, we found the remains of two birds which had been killed by foxes. Great Horned and Barred Owls also occasionally capture grouse, but these predators are not common. We have learned of one instance of the capture of a grouse by a Red-tailed Hawk; but this is rather unusual.

While most grouse at Pymatuning have reddish-brown tails and are of average size, it is well known that larger, gray-tailed birds are sometimes found, particularly in fall and winter. There is a possibility, it seems to me, that these birds have invaded the region from the north. These so-called "silver-tails" are sometimes quite abundant in the mountainous districts to the eastward.

87. *Meleagris gallopavo silvestris* Vieillot. WILD TURKEY (310a).

Formerly a permanent resident, said to have been locally abundant, particularly in the wildest portions of the Swamp, where cover and food conditions were ideal. Mr. Ralph J. Ferris of Linesville, who has devoted himself to considerable research concerning the former status of the Wild Turkey at Pymatuning, has probably determined as accurately as can be determined the history of the last flock of these splendid game-birds. He states in a letter: "Formerly the Wild Turkey was very common in the Swamp and the territory surround-

ing it. Their last stand in this region was on the numerous islands within the Swamp, where they were protected by the wildness of their environment. The last surviving flock of which I have been able to get any record contained eight birds. Mr. William G. Hayes of Linesville was an eye-witness to the killing of two from this flock in the fall of 1881 or 1882 upon the land of his uncle, William Hayes, which bordered the southern side of the Swamp. Both birds were shot by Robert Hayes in company with the late Mr. Arnold Kintzler and my informant.

"The circumstances attending the killing of these birds I will recount as told to me by Mr. Hayes. For some time during the fall of the year Wild Turkeys had been working in a field of buckwheat on the farm of William Hayes near the edge of the woods, and had been seen by Arnold Kintzler. Kintzler came riding into the doorway of the Hayes farm early one morning very much excited, stating that the Wild Turkeys were in the buckwheat. Robert and William G. Hayes, nephews of the owner of the field in which the turkeys had been seen, started out with a rifle and shotgun together with Kintzler and crawled along the fences in the hope of getting a shot. The eight Wild Turkeys flew from the field into some tall trees along the edge. The boys, by keeping some trees between them and the birds, stalked them within shooting distance. The boy with the rifle was rather nervous and as the birds were beginning to stretch their necks and look around, the other boy fired one barrel of his shotgun at one bird and the other barrel at another, killing both birds. This was the last time Mr. Hayes saw the flock. The other birds were probably killed soon after by other hunters. These Wild Turkeys stayed on Glenn, Whaley, and other islands, but came out of the Swamp into the cleared lands to feed."

It is probable that the Wild Turkey ranged over most of Crawford County before the original timber was cut or burned. Likely their habits were similar to those of the few birds which yet remain in the high mountains to the south and east, although in times of danger the birds probably moved to the most inaccessible parts of the Swamp for safety, instead of to the highest elevations as they do in the mountains. Mr. Kirkpatrick rather doubts that the Wild Turkeys found even as early as 1870 were of the original strain present in pioneer days. Many of the oldest citizens of Meadville, according to this observer, believe that the original turkeys had disappeared long before 1870,

and that the birds then found at Pymatuning had strayed from the surrounding farms.

88. **Ectopistes canadensis** (Linnæus). PASSENGER PIGEON (315).

Formerly an irregularly abundant transient visitant, and probably a summer resident, although the meagre accounts of nesting activities, which are somewhat at variance with much published data, do not appeal to me as being unquestionably authentic. The impenetrable areas of the great Swamp must have been a wonderful refuge for the birds upon occasion; but it is doubtful if they ever occurred either while feeding or roosting in the alder-covered tracts. Probably they frequented the open fields, the deciduous woodlands, and groves of conifers.

Mr. Langdon, who has spent considerable time in investigating reports of the Passenger Pigeon at Pymatuning writes as follows: "Mr. Nelson Gehr, who was born near Pymatuning in 1855 and who has resided here continuously for the past seventy years, has given me the following information. He is reliable, and a keen student of wild-life from the viewpoint of the woodsman; while not scientific, he is sincere in every statement.

"In the days of Mr. Gehr's early youth Passenger Pigeons nested in what is now his woods and also at Hemlock Point by the hundreds. He assisted in raids where bag after bag both of mature birds and squabs were taken. They nested in colonies, many rough, cross-work nests on one tree. In each nest were laid one or two eggs. When these eggs hatched and the squabs reached a little size two more eggs were laid, which were hatched by the heat of the first two squabs. Thus the young were in assorted sizes. Mr. Gehr believes that with such crowding as was necessary two or more females may have laid in the same nest. The birds suddenly disappeared and he saw none for years until in 1899 when he observed a flock of thirteen. He has never seen any since."

Mr. Ferris kindly furnishes the following notes: "The last flocks of Pigeons which roosted in Pymatuning occurred forty-five or fifty years ago. A flock of nine or ten birds were seen about 1888 by Mr. William G. Hayes along the southern edge of the Swamp.

"Mr. Hayes described one of the great flights observed when the Pigeons were numerous. The flights generally took place in the early morning or toward evening as the birds moved from or into their

usual roosting quarters. Imagine a sheet of birds from one to one and one-half miles in width, passing continuously for over an hour in such numbers as to give the appearance and shadow of a cloud between the earth and sun, and some idea of the vast numbers of these birds may be formed. Usually they flew ten or twelve feet from the ground. They rose in waves to pass over fences and trees but sometimes they flew from thirty to fifty feet in the air without the undulating motion. It was often necessary to station men in the fields of late grain to keep the birds from destroying the crops.

“Pigeons were killed and shipped away from this vicinity by the thousands in the days of their great flights. Some were caught in nets; others were killed on their roosts at night with gas fumes. These were probably the most efficient means of slaughter. Some clubbed the birds, securing the ones actually killed, but allowing many of the wounded to escape, only to die later. Sometimes the birds were picked from their roosting places with the use of lights. Still another means of capture was a long pole firmly placed in the ground with its top extending into the air; when the flights were on, this pole was whipped back and forth among the flying pigeons. Thus a great many were killed; but probably as many more, which were never secured, died as a result of broken wings and legs.”

Mr. Kirkpatrick states: “Undoubtedly this bird nested in Pymatuning as well as in other parts of Crawford County, but, so far as I know, there is no record of any such colonies as occurred in Elk, Forest, Warren, Potter, McKean, and Cameron Counties, and in those sections it appears that they were only casual. It evidently roosted in this region in large numbers, for we find in Bates' history of Crawford County the following statement: “Pigeons in the spring and fall covered the County, their favorite roosting places being Conneaut and Pymatuning Marshes.” According to my observations its occurrence in the Meadville region was very irregular. This seems to have been true throughout much of its range. There were large flights in 1870, 1876, 1878 and 1880. A few small flocks were seen in 1883. Where they came from and where they were going we could only surmise. Probably they paused here for food while coming from or returning to some distant nesting ground.

“I can remember seeing at the Wells-Fargo Express Company in this city large crates filled with live wild pigeons that had been netted in Forest or another adjoining county. They had been shipped over

the Franklin Branch of the Erie Railroad and transferred to the main line here for shipment eastward. An old citizen remembers that on Easter Day, April 12, 1857, there was a great flight through this locality, which owing to the heavy snowstorm passed so low that men stood on the roofs of houses and knocked them down with poles."

Mr. Kirkpatrick has written so interestingly of his experiences with these birds, in an early issue of the Meadville Times-Republican that part of the account is quoted here:

"Even in the '70's, the writer's boyhood days, Passenger Pigeons were sometimes very plentiful in this locality, more so in the spring than in the fall. While no large compact flocks, or roosting- or nesting-grounds were seen, numerous small flocks or detachments thereof would fly eastwardly, across the French Creek valley, for several hours at a time. I was attending the South Ward school in those days, and remember seeing the pigeons flying over past the school-room windows, and hearing the loud reports of firearms on the ridge south of Huidekoper Park. This ridge was a favorite stand for gunners in those days for here the birds flew quite low. It can be imagined what a trial it was for me to stay in school, for I had just come into possession of my first gun, and was interested in the wild-life inhabiting our woods and fields. I remember one flock in particular met with in the late spring. The birds were on the ground, feeding on maple buds that had fallen off the trees. Vegetation was well advanced, so much so that it was almost impossible to see a bird any distance away on the ground unless one searched very closely. In leisurely walking through a piece of this woodland, never thinking of pigeons, a single bird that had been feeding some distance away from the body of the flock rose from the ground and alighted on the lower branch of a tree a short distance ahead of me. This bird I secured. At the report of the gun about three hundred arose from the ground just out of range and flew away, leaving the astonished writer to gaze at them until they were lost to view. In the fall they were often seen in the forests or open woodland, singly or in small parties, perched sentinel-like on the topmost dead branches of some tall tree, their trim forms outlined against the sky. I last saw the pigeons in this locality in the spring of 1883, when a few small flocks flew over the lower part of the city."

Dr. Samuel P. Bates in his history of Crawford County writes: "In a part of the Swamp is a growth of tamaracks where in the fall of the year vast flocks of wild pigeons from Canada and neighboring

breeding places made it their roosting ground. In the hot summer nights the constant flapping of their wings produced by being crowded from their perches, gave forth a sound not unlike the distant roar of Niagara. Hunters would enter the swamp in the drouth of summer, and aiming at a limb bending down with the weight of birds, would fire, and having struck a light and picked up as many as could be discovered in the tall grass, would pass on for another shot."

89. *Zenaidura macroura carolinensis* (Linnæus).

MOURNING DOVE (316).

A common summer resident, and to a degree a transient, since a comparatively small number of birds pass farther north to nest. It may also occasionally remain in winter when food is plentiful, as it does in adjacent regions to the southward. It has been known to arrive in March: March 19, 1909, and March 28, 1908, Meadville (Kirkpatrick); March 29 and 30, 1926, Linesville (Sutton); but it becomes abundant later: April 14, 1892, Meadville (Kirkpatrick); April 16, 1925, Shermansville (Langdon); April 17, 1922, Hartstown (Hunter). The first nests may be built very early and eggs laid long before the warmth of spring is assured, Mr. E. E. Hunter of Hartstown having found fresh eggs as early as March 31, 1920. Probably the pair which built this nest were mated long before they reached this latitude.

Nests with eggs are not customarily found until latter April or early May however: April 29, 1922, nest being built, Lower Lake (Sutton); May 4, 1892, two eggs, Meadville (Kirkpatrick); May 6, 1922, eggs laid in an old Blue Jay's nest which had been built on a low pine bough, one mile south of Hartstown (Sutton); June 19, 1915, two eggs, Meadville (Kirkpatrick). Mr. Kirkpatrick has found young birds in the vicinity of Meadville on the following dates: July 25 and August 4, 1914; August 30, 1922. On August 27, 1925, we found a nest and half grown squabs at the confluence of Conneaut and French Creeks.

During latter September, 1925, doves were very numerous all about Pymatuning, and large flocks of the immature birds were seen daily either walking about in the fields or resting calmly on the wires. On November 4, 1926, Mr. Bergstrom noted a flock of fourteen not far from Shermansville.

The abundance of this species from year to year is variable. During 1923 very few birds were seen, whereas in 1925 at least forty pairs were daily observed near Hartstown.

90. *Cathartes aura septentrionalis* Wied. TURKEY VULTURE (325).
Plate VIII.

The Turkey Vulture probably never winters as far north as Crawford County in Pennsylvania. It arrives at Pymatuning early in the spring, however, and remains until the young are reared; after late July it is likely to wander a great deal, and may even leave the region altogether until the following spring.

Our earliest dates of arrival are: March 31, 1926, Shermansville (Sutton); April 9, 1925, Linesville (Langdon). On April 28, 1922, several vultures were observed circling about the Swamp; I believe they were mated and nesting at the time. Mr. Bergstrom knows of a nest and two eggs which were found north of the corduroy-road near Shermansville during May, 1923. Two workmen had been eating lunch seated on a fallen tree. While they were resting they heard a commotion under them, and upon investigating flushed a vulture from the hollow of the log. Mr. J. G. Crumb of Linesville is aware that the birds have nested in this same vicinity (as he puts it: "one and one-half miles below Linesville") and he has not infrequently observed from twenty to seventy-five vultures flying about over the Swamp. Mr. Bergstrom had the good fortune to discover a Turkey Vulture's nest in Summit Township, about one and one-half miles north of Harmonsburg, on May 29, 1927. On this date the two much incubated eggs lay on a pile of decayed wood in an old beech log which was about fourteen feet long and three feet in diameter. When Mr. Bergstrom and Mr. Wilt returned to the nest to secure photographs on June 15, the downy young were several days old. The parent bird (probably the female) refused to leave the nest when the young were being brought out for inspection. She feigned death ably and offered no resistance as she was dragged from the nesting cavity. Mr. Bergstrom states that her acting was so convincing that he thought she was at the point of death.

The Turkey Vulture is often seen at Conneaut Lake, and according to Mr. W. W. Andrews of Pittsburgh, nested in the vicinity of Custards in the spring of 1910. They are very rare at Meadville, however, according to Mr. Kirkpatrick, whose only record is based upon a male specimen taken at Custards on October 10, 1911.

I have never observed more than fifteen or twenty vultures at once flying over the Swamp. They doubtless nest in the black ash forests

west of Linesville, for they are seen there frequently during the summer. On August 29, 1925, a flock of ten birds was seen near the humus-plant north of Hartstown. This same flock was often observed as they soared along the road searching for snakes, rabbits, chickens, and woodchucks, which had been killed by automobiles.

The occurrence of this bird in the present region is most interesting. Considerable inquiry has proved that in many localities only ten or twelve miles from Pymatuning, vultures have never been seen. It is probable that this large, wild area is the only such spot in the whole of the region which the birds care to frequent. A somewhat similar condition seems to exist in the "Limberlost" of Indiana.

In the fall Mr. Bergstrom has noted it as late as October 15, 1925, and October 5, 1926, at Shermansville. It probably irregularly stays later, unless it must wander in search of food.

91. ***Circus cyaneus hudsonius*** (Linnæus). MARSH HAWK (331).

The Marsh Hawk is an abundant transient visitant and summer resident not only in the Swamp and about Conneaut Lake, but throughout the countryside, where it may nest in brookside weed-patches, or near farm-yard ponds. As a winter resident it is comparatively rare, although one adult in beautiful gray plumage was observed daily from February 18 to 20, 1925, Hartstown (Sutton), and Mr. Langdon saw several at Conneaut Lake on December 5, 1925, and two as late as December 25.

March 10 and 20, 1925, Conneaut Lake (Langdon), may not represent the average date of arrival in spring, but it is certain that by April 10 (at which time a pair were shot at Pymatuning and examined by Mr. Langdon) most of the local representatives of the species are on hand. Mr. Welshons took specimens on March 20 and 25, 1913, at Conneaut Lake.

When we first came to the Swamp (April 27, 1922) Marsh Hawks were circling everywhere and noisily courting. From the secluded recesses of the marsh would sound the insistent Flicker-like calling of the birds as they chased each other. Often we saw the odd tumbling antics of the male bird, which always inspired wonder and comment. These performances were given in particular portions of the Swamp, and naturally our approach usually caused the drama to cease. By May 3, 1922, six pairs at least had been located. On May 8 a nest and two eggs were found near Hartstown; on May 13 nests

with four and five eggs respectively were found near the humus-plant. On May 16 the latter nest with its set of five and another set of six eggs were collected, together with one female bird. The parent birds (principally the females) were vehement in their attacks whenever we approached the nests. Their rather thin call-notes sounded something like those of the Duck Hawk, but were not nearly so powerful. Sometimes the males circled high in air while the females carried on the attack. During 1923 nests with eggs were found on May 17, May 30, and May 31. On June 16 a nest with two eggs and two young, and on June 18 a nest with five small young were found. In 1924 a nest with five eggs was found on May 30. During 1925 a nest with five eggs was found on May 15 near Geneva Township, and at least ten nesting pairs were observed. Mr. Kirkpatrick found a nest and seven well feathered young at Conneaut Lake on July 1, 1897.

From the above data we conclude that there are full sets of eggs as a rule by the middle of May. These it would appear are hatched within the following four weeks (our first date for young being June 16, 1923). The usual number in a set seems to have been five, although sets of six were common. Sets of four and seven eggs were extreme.

The eggs were all pale bluish white, and one set (collected May 16, 1922) were beautifully marked with delicate brown. In all cases the nests were built on the ground in the cat-tails, among high weeds, or in a tussock of grass among the alders. The nests were rather carefully made. Once an incubating female was closely watched before she flushed. She sat with neck stretched upward very high.

If one may judge from our limited experience with the nests containing young birds, the Marsh Hawk kills a good many smaller birds as food during latter May and June. Young Red-winged Blackbirds were constantly found at the Marsh Hawk nests, and the young (chiefly) of Song and Swamp Sparrows were also found, as well as one decapitated Sora Rail. A male, secured by Mr. Langdon on April 20, 1926, had only the remains of a field mouse in its stomach.

One adult female (secured with her nest) is rather grayer in coloration than any female bird I have ever seen, and naturally suggests the possibility that the really full-plumaged female may be pale gray like her mate. In four female specimens observed three had pale yellow eyes, more or less like those of the male. In one, however, the iris was hazel brown. In immature specimens taken in the fall the iris

was always deep brown. The downy young, just hatched, were of a beautiful creamy buff color, with eyes of deep blue-black.

In the fall it is impossible to distinguish the locally reared immatures from those which move southward from Hudson Bay and other northern regions. However, an influx of new individuals was thought to occur on September 17, 1925. Several observers have repeatedly seen Marsh Hawks in October and November: October 22 and 23, 1925, two females secured, Conneaut Marsh (Bergstrom); October 30, 1924, Hartstown (Hutchens); November 18, 1921, Hartstown (Hunter).

92. **Accipiter velox** (Wilson). SHARP-SHINNED HAWK (332).

While the Sharp-shinned Hawk sometimes occurs throughout the year it has been recorded chiefly as a migrant in April and May and in the middle of autumn. It rarely nests. Mr. Bergstrom saw one near Shermansville on January 7, 1926; this is our only winter record. Our earliest spring records probably do not represent the average date of arrival: February 23, 1926, Meadville (Kirkpatrick); March 30, 1926, female taken, Atlantic (Langdon); April 8, 1914, female taken, Conneaut Lake (Welshons). We recorded one at Pymatuning on May 2, 1922, and Mr. Kirkpatrick took one at Meadville on May 8, 1911. An adult specimen, taken by Mr. Welshons on June 6, 1910, at Conneaut Lake, probably was a nesting bird.

On May 7, 1925, Mr. Langdon secured a male in full but rather frayed plumage at Conneaut Lake. The swollen condition of the testes of this specimen indicated breeding activity. Although the bird was unquestionably adult, the irides were not clear red, but bright red-orange, with a clear, coral-red circle at the outer edge.

On June 16, 1923, the presence of the nest of a Sharp-shinned Hawk was indicated when a small male was seen fiercely chasing a Crow. The broad and beautifully built structure was finally found thirty feet up in a dense hemlock. It contained five small young, and a broken egg, which may have been destroyed by the Crow. The tree in which the nest was located was one of a dense clump growing at the edge of the Swamp about one mile southwest of Linesville. The parent birds were unusually quiet at their nest, and were apparently afraid, for they did not attack us. Perhaps a male bird seen chasing a Crow on May 11, 1922, also had a nest.

Mr. Welshons has taken several immature specimens in the fall,

and one adult female on September 1, 1912. Judging from our field work in the fall of 1925, I should say the Sharp-Shinned Hawk is sometimes rather abundant during the fall migration, since it was regularly seen during early September.

The female specimen taken by Mr. Langdon at Atlantic, on March 30, 1926, had the remains of a Song Sparrow in its stomach.

93. **Accipiter cooperi** (Bonaparte). COOPER'S HAWK (333).

Aside from the almost ubiquitous Marsh Harrier this fierce, predatory species and the Red-shouldered Hawk are the commonest members of their tribe. Cooper's Hawk occasionally remains through the winter, although like the Sharp-shinned Hawk it is usually a transient and summer resident, arriving in the latter part of February and early April and leaving in middle or late December. On February 9, 1910, Mr. Kirkpatrick took one at Meadville, which had been about the farm where it was secured for some time, no doubt attracted by a flock of domestic pigeons, of which it had killed about twenty. While these birds were often seen in the Swamp, they apparently nested only in the woods on the higher elevations, and preferably on beech trees.

On May 14, 1922, a nest and four eggs were found near Hartstown, in a beech tree about sixty feet from the ground. The bulky structure was built into a slender four-pronged crotch, near the end of a vertical branch. The lining of the nest was composed entirely of small pieces of sycamore bark. Under this nest, and plainly in view from it, were the nest and three eggs of a pair of Cerulean Warblers, yet during the two days of observation about the tree the hawks were never seen to disturb their small neighbors. On May 15 this nest and the large female bird were collected. She was in frayed and rather pale plumage. On May 16, 1923, a nest containing five eggs was found two and one-half miles northwest of Hartstown. This nest was also in a beech tree. The cries of the parent birds decidedly resembled the cackling call-notes of the nearby Pileated Woodpeckers. On May 16, 1925, a nest and five eggs were found only about twenty-five feet up in a beech tree growing at the sloping edge of the Swamp three miles west of Shermansville. On June 22 the four young birds (one egg was infertile) were about half-developed, according to Mr. Langdon. The dusky primary feathers, and rows of dark quills along the breast and shoulders were appearing through the white down.

An adult male in the collection of Mr. Welshons was taken on

November 7, 1912, at Conneaut Lake. Mr. C. R. Fritz of Linesville has an immature female specimen taken in late December, 1923, which may have been a winter resident.

One difference was most noticeable in the nesting activities of the Cooper's and Sharp-shinned Hawks. About the clump of hemlocks where the Sharp-shinned Hawks nested there were absolutely no small birds. When one entered that dark clump of evergreens one seemed to be in a lifeless spot. Without question the smaller birds had all either been captured or frightened away. About the nests of the Cooper's Hawk this was not at all the case. One might properly infer, I should say, that Cooper's Hawk hunts its prey some distance away, whereas the Sharp-shinned Hawk takes everything which occurs near its nesting-grounds.

Mr. Kirkpatrick states that Cooper's Hawk was seen quite frequently in the rural districts surrounding Meadville before the Bounty Law of 1885 was enacted. It has gradually disappeared since then, so that it is now seldom encountered. Mr. Kirkpatrick also furnishes the following interesting note: "I once observed a Cooper's Hawk near the nesting-stub of a Flicker, which to all appearances was waiting for the owner of the nest to leave. At any rate, no sooner had the Flicker done so, than the hawk struck and killed it, and feasted upon it at once. In spite of the fact that I walked up to within forty feet of it to shoot, it would not take wing nor relinquish its hold on its prey."

94. *Astur atricapillus atricapillus* (Wilson). GOSHAWK (334).

This rare species probably occurs only in late fall and winter, though it may formerly have nested, since it occurs virtually as far south during summer in the higher regions to the east of Crawford County (Sutton, Notes on the Nesting of the Goshawk in Potter County, Pennsylvania, *Wilson Bulletin*, Vol. XXXVII, December, 1925, 193-199). Mr. Kirkpatrick mounted a beautiful male specimen taken on December 18, 1906, near Meadville. Mr. Bergstrom saw one at Conneaut Lake on January 5 and 8, 1926. Mr. Langdon states that from January 13 to 24, 1926, several were seen at different points in the Pymatuning region; unfortunately none was collected. On February 20, 1925, north of Hartstown a very heavy bird (probably a female) flew in a leisurely fashion directly above us and alighted on a tamarack which stood among the alders.

The occurrence of this species is doubtless erratic, since it is known to move southward in large numbers only when for some reason winter food conditions in the north compel it to migrate. It is interesting to note that during the remarkable invasion of this species during the winter of 1926-1927, no Goshawk was recorded from Crawford County, and but few were seen or taken in Erie County. It has seemed plausible to me that the Goshawks in moving south from their normal Canadian range avoided direct flight across Lake Erie, and therefore moved either to the eastward or to the westward along the shore before sweeping across Pennsylvania. However, the Snowy Owl, which invaded the state at the same time, did not hesitate to fly across the lake (See Sutton, *Cardinal*, July, 1927, 35).

95. **Buteo borealis borealis** (Gmelin). RED-TAILED HAWK (337).

This is the only hawk of the region which is regularly a permanent resident. The following dates indicate its presence the year round: January 20, 1925, Shermansville (Bergstrom); February 19 and 20, 1925, Crystal Lake (Sutton); March 31, 1899, Meadville (Kirkpatrick); May 16, 1922, Hartstown (Sutton); September 24, 1925, Lower Lake (Sutton); December 4, 1905, French Creek (Kirkpatrick). It nests in small numbers in the highest woodlands of the Swamp and also in the deciduous woods on the higher ground of the surrounding country. On March 30, 1926, I collected a set of three well incubated eggs from a huge nest in the top of a pine tree near Atlantic. An adult female specimen, secured by Mr. Langdon on April 14, 1925, had not apparently entered upon the duties of incubation since her belly was completely covered with feathers. In her stomach were the remains of a field mouse (*Microtus*) and one small snake, which I did not identify. On May 7, 1922, a pair which had built their nest in a black birch were located on Cherry Island on the property of Mr. W. A. Ellis, south of Hartstown. Probably eggs or small young were in the nest at that time.

On May 9, 1925, Mr. Langdon found a nest containing two third-grown young, which were covered with down of a dirty grayish white color, paler underneath. These birds had recently been fed upon field-mice, frogs, and a young fowl of some sort, perhaps a chicken. A male specimen in Mr. Welshons's collection was taken on May 9, 1912, at Conneaut Lake. Mr. Kirkpatrick found a nest with two eggs near Meadville on May 16, 1880.

A large and very handsome immature female bird was secured at Lower Lake on August 28, 1925. In its stomach were remains of two crickets and two katydid. A male taken two miles north of Hartstown on February 12, 1927 had the remains of field-mice in its stomach.

If the most northerly individuals of the present species do move southward in winter we have no way of recognizing them. It is probable, however, that the nesting birds of Pymatuning actually stay throughout the year, since food is usually abundant.

The Red-tailed Hawk is characteristic of the upper woodlands; the Red-shouldered Hawk is noticeably more abundant in the Swamp proper.

96. *Buteo lineatus lineatus* (Gmelin). RED-SHOULDERED HAWK (339).

During 1922 the Red-shouldered Hawk was the only species of hawk which was considered really abundant in the wooded sections of the Swamp. During subsequent years it was found to be not nearly so common, and in 1925 was apparently quite rare. It occasionally remains through the winter: December 10, 1925, Shermansville (Bergstrom); January 11, 1909, French Creek (Kirkpatrick); January 20, 1926, Hartstown (Bergstrom); February 12, 1926, Conneaut Lake (Langdon). Their nests were, with one exception, always found in the woodlands of the lower country, and were built in much lower trees, or lower in the trees, than those of the Red-tailed Hawk.

On March 28, 1926, I found two nests near Hartstown, one of which was built in a dead pine and was heavily lined with fresh hemlock; it held one fresh egg. On April 4, 1904, Mr. Kirkpatrick found four downy young in a nest near Meadville. On April 27, 1922, a nest containing four much incubated eggs was found in a high slender beech tree near Crystal Lake. This set and nest, the lining of which contained sprigs of fresh hemlock, were subsequently collected with the female bird. On April 29 a nest with three eggs was found fifty feet up in a red maple, in an upper woodland about a mile west of the Swamp. These eggs were not much incubated. Mr. Kirkpatrick found a nest and four young on May 17, 1897, near Meadville. On May 17, 1925, a nest, presumably with young, was found near Meadville Junction Pond, high in a tall beech tree. On May 24, 1925, Mr. Langdon sent in for examination three downy young birds, the primary feathers of which were just breaking through the down. Even at this early stage the slenderness of the tarsus of the Red-shouldered

Hawk was noticeable, when compared with that of the Red-tailed Hawk. On May 30, 1924, a nest with young birds about half grown was found near Crystal Lake.

None of the nests of the Red-shouldered Hawk was as large or bulky as those of the Red-tailed Hawk. The screams of the smaller species were always easily recognizable, being clear and loud, and never wheezy or windy. The flight of the Red-shouldered Hawk was also noticeably more rapid, buoyant, and owl-like than that of the Red-tailed Hawk. The color of the down on the nestlings of the two species was to me indistinguishable, although unfortunately specimens could not be saved for direct comparison.

Immature specimens were shot on September 1, 11, 14, 21, and 22, 1925, and their stomachs carefully examined. In No. 1 were five small snakes, and the remains of a Field Mouse (*Microtus*); No. 2: Field Mouse remains, probably of three individuals; No. 3: Eighteen grasshoppers, and the remains of a crayfish; No. 4: Twenty-two grasshoppers; No. 5: One grasshopper, and a White-footed Mouse (*Peromyscus*). Mr. Langdon found the species much more harmful in the spring. He was once led to the nest of a Red-shouldered Hawk by the squawking of tiny goslings which the hawks were carrying away alive.

97. ***Buteo platypterus platypterus*** (Vieillot).

BROAD-WINGED HAWK (343).

Never common, although it occurs as a migrant and very likely as an occasional summer resident. April 28, 1925, French Creek (Langdon), probably represents the average date of arrival. The bird seen May 15, 1922, had doubtless been about for a few days before it was noted. This single individual seemed to have no mate. Mr. Kirkpatrick took a female specimen on May 15, 1893, near Meadville, and a male on May 20, 1924, which is in the plumage of the immature bird. He feels certain that these birds, if not actually nesting, were about to do so. Mr. Langdon has a handsome adult specimen taken on June 3, 1921, near Titusville, considerably to the eastward of the present area.

98. ***Archibuteo lagopus sancti-johannis*** (Gmelin).

ROUGH-LEGGED HAWK (347a).

A rare transient or winter visitant, which is known to erratically sweep southward in large numbers. We have but two local records.

Mr. Welshons secured a male in normal light phase of plumage on November 22, 1924, at Conneaut Lake. Mr. Kirkpatrick mounted a specimen in black phase of plumage, which was taken near Cochran-ton by Mr. William Yarnall of that town on November 26, 1925. Two school boys captured a crippled Rough-legged Hawk in normal plumage on November 28, 1926, about two miles south of Greenville, Mercer County, and brought it to Mr. E. M. Mixer of Farrell, who kept the injured bird until its death on April 26, 1927. It was immediately forwarded to my office at Harrisburg for identification. There is no reason that this large raptorial should not be seen occasionally in winter since it has been not infrequently recorded much farther south.

99. ***Aquila chrysaëtes chrysaëtos*** (Linnæus).

GOLDEN EAGLE (349).

While Mr. Langdon and others feel confident that they have seen Golden Eagles occasionally both at Pymatuning and Conneaut Lake, the inclusion of the species is based entirely upon the feathered feet of a specimen found nailed to an old barn a little east of Stewart's Corners, a few miles west of Pymatuning Swamp. The circumstances and date of the taking of this specimen are entirely matters of conjecture, although it is obviously fair to regard it as a local record.

The species probably occurs principally in winter and is to be regarded as a rare straggler from the Pennsylvania mountains, or from the north. An eagle observed flying over Hartstown on February 25, 1925, by Mr. R. E. Hutchens, may have been of this species. It was, at least, obviously not an adult Bald Eagle.

100. ***Haliaëetus leucocephalus leucocephalus*** (Linnæus).

BALD EAGLE (352).

Although this species is said on good authority to have nested formerly, it is now found only as an occasional visitor, commonest during spring and summer, when it doubtless wanders over from Lake Erie where it is locally abundant (Todd, *Birds of Erie and Presque Isle*, 1904, 554). One would expect the birds to be more regular at Conneaut Lake than at the small lakes of Pymatuning, but this was not found to be the case. Both adult and immature individuals were observed at the Swamp on May 5, 1922, and June 16, 1923, and once or twice subsequently by residents of Hartstown. At Conneaut Lake

Mr. Bergstrom saw one on April 16, 1925, and Mr. Langdon, one on April 29. Mr. Matz Keck obtained an immature specimen near the head of Conneaut Lake on May 8, 1897. Mr. Kirkpatrick has recorded it also near Meadville on the following dates: June 6, 1898; June 23, 1894; July 22, 1910, adult; and August 5, 1896, immature. These numerous summer occurrences indicate that the Bald Eagle wanders a great deal in search of food, since the nearest nesting pairs are almost certainly along the shore of Lake Erie.

There are no late fall, winter, or early spring records for this species at hand.

101. **Rhynchodon peregrinus anatum** (Bonaparte).

DUCK HAWK (356a).

While no local specimen of this species has been taken, so far as I have been able to determine, there seems to be no doubt that it occasionally visits Conneaut Lake, especially during the height of the migration of waterfowl. Mr. Ralph J. Ferris tells me of a bold hawk that regularly caught domestic pigeons at a farm near Linesville. He writes, quoting Mr. William Hayes: "The pigeon attempted to get into a hole in the side of the barn. The hawk was close behind and just before the pigeon entered the hole it was struck from below in the breast." These tactics are decidedly those of a Duck Hawk, and not, so far as I know from personal experience, of any other species. A Duck Hawk was seen to strike and kill a Coot near Hotel Conneaut on May 2, 1925, within full view of numerous bystanders. Messrs. Langdon and Bergstrom feel certain they saw the same individual again on May 29, 1925. It is at present to be regarded as a rare and irregular transient; with better knowledge of its routes of migration, however, it may eventually be considered only a straggler.

102. **Tinnunculus columbarius columbarius** (Linnæus).

PIGEON HAWK (357).

A rare but fairly regular migrant, for which we have only a few records. It is apparently commoner in fall than in spring. Mr. Kirkpatrick recorded one at Meadville on the remarkably early date of February 22, 1926 (*Cf.* Christy, *Cardinal*, No. 8, July, 1926, 21). Mr. Welshons took a male at Conneaut Lake on March 31, 1914. I saw one at close range at Crystal Lake on April 28, 1922.

In the fall I saw one flying over Conneaut Lake on September 8,

1925, and another at Pymatuning Swamp on September 11. In both cases the high-flying birds were, strangely enough, pursued by hosts of Barn and Tree Swallows, which twittered loudly and flew in a deliberate manner just behind and on either side of the hawk. It is possible that the hawk had captured and was carrying away one of them. Mr. Bergstrom saw one near Shermansville on November 9, 1925. Mr. Kirkpatrick took an adult near Meadville on November 20, 1909.

103. *Cerchneis sparveria sparveria* (Linnæus).

SPARROW HAWK (360).

A rather rare summer resident in the Swamp, somewhat commoner on the higher ground to the east, west, and south; occasional as a winter resident, as Mr. Bergstrom's records for 1926 tend to show: Conneaut Lake, January 6; Shermansville, January 17; Conneaut Lake, February 1-28. Mr. Kirkpatrick took a male on December 31, 1909, at Meadville. We saw three near Hartstown on February 12, 1927. Mr. Kirkpatrick's record for March 8, 1892, and Mr. Bergstrom's for March 18, 1925 (male secured), probably mark the first of the spring migration.

During 1922 a pair were observed near Hartstown from April 27 on for several weeks. These birds had a nest in a huge dead walnut tree. They successfully reared at least five young, which were seen by the nearby farmers later in the summer. On June 1, 1924, a pair with their nest in a high stub were found two miles south of Linesville. I do not know what was in the nest; there were probably young birds. In early August of the same year the five (or six) young which were reared in this nest were seen. In 1925 not a Sparrow Hawk was noted anywhere during the spring and their absence could not be accounted for; but in the fall several birds, both immature and adults, suddenly appeared near Shermansville on August 21. Either these were local birds which had strangely escaped notice, or they were birds from the surrounding district which moved into the Swamp upon the full development of their young. On June 25, 1927 a young Sparrow Hawk in natal down was brought to Mr. Bergstrom. It had fallen from its nest in a high, dead maple near Shermansville. Mr. Bergstrom secured a handsome female bird on September 19, 1925, which had grasshoppers and katydids in its stomach. Sparrow Hawks were

abundant until October 1, 1925. Mr. Bergstrom saw three at Hartstown on October 5, 1926.

Mr. Kirkpatrick states that the Sparrow Hawk was formerly common in the Meadville region, but that it has seldom been seen in recent years.

104. **Pandion haliaëtus carolinensis** (Gmelin). OSPREY (364).

Warren (*Birds of Pennsylvania*, 1890, 143) states that Mr. Kirkpatrick at that time regarded the Osprey as a rare migrant in Crawford County. Our numerous records tend to show that today it is fairly regular and common at Conneaut Lake and Pymatuning Swamp. It arrives in early and mid-April. Mr. Langdon saw it regularly from April 2 to 23, 1926, at Conneaut Lake. Mr. Welshons took a specimen at the Lake on April 7, 1913. Other spring records selected at random are as follows: April 30, 1896, Meadville (Kirkpatrick); April 30-June 1, 1924, recorded every day, Conneaut Lake (Bergstrom and Langdon); May 6, 1907, Meadville (Kirkpatrick); May 7, 1911, specimen taken, Conneaut Lake (Welshons); May 8, 1892, specimen taken at Doan's Pond, east of Meadville (Kirkpatrick).

While there is no evident reason that the Osprey should not nest in the present region, apparently it does not. It has been noted often in mid summer, however, at Conneaut Lake. Mr. Arden Yokes of Harmonsburg took a male on May 26, 1925, at Meadville Junction Pond. Mr. Langdon thus saw it on June 3 and 15, and throughout July, 1926.

Our fall records are all in August and September: August 25, 1905, Meadville (Kirkpatrick); September 8, 1893, Meadville (Kirkpatrick); September 8 and 9, 1925, Crystal and Conneaut Lake respectively (Sutton); September 26, 1901, Meadville (Kirkpatrick).

105. **Tyto alba pratincola** (Bonaparte). BARN OWL (365).

A summer resident, which has become commoner during recent years, and which occasionally or perhaps habitually remains throughout the year. Our few records do not clearly indicate any seasonal movements. Warren regarded it, on the authority of Mr. Kirkpatrick, as a straggler in Crawford County (*Birds of Pennsylvania*, 1890, 145). Mr. Kirkpatrick first recorded it at Meadville in 1878, in the fall. Not until April 28, 1914, did he note it again; on this date the wing from a specimen taken a few days before on the outskirts

of the city of Meadville was examined. Since 1914, and particularly during the past six years, numerous records have been added. It appears that this somewhat southern species is, like the Cardinal, Tufted Titmouse, and Red-bellied Woodpecker, gradually extending its range to include the present region.

Mr. Kirkpatrick has two winter records for Meadville: December 29, 1925, a male taken; and January 13, 1926. We saw one in the Swamp northeast of Adamsville on March 29, 1926. It had evidently spent the winter in the dense hemlocks for the ground was strewn with pellets and many loose feathers. A nesting pair were found by us three miles west of Linesville on May 17, 1925, in a huge, dead sycamore. Mr. Earl Huidekoper found a pair nesting in his large barn on the western shore of Conneaut Lake on July 10, 1917. The six young birds were subsequently observed. We saw a Barn Owl near Hartstown on June 2, 1922, and Mr. Langdon saw one near Espyville on August 30, 1925.

Our fall records are as follows: September 14, 1926, Shermansville (Bergstrom); October 12 and November 1, 1922, and November 3, 1925, Meadville (Kirkpatrick); November 26, 1925, a male specimen taken by Mr. Ted Kiskadden at Hartstown.

Among the numerous pellets found on March 29, 1926, were loose feathers of the Slate-colored Junco, Meadowlark, and Song Sparrow. The pellets contained remains of *Microtus*, *Peromyscus*, *Blarina*, and *Tamias*, as well as some feathers and bones of birds which were not identified.

106. *Asio otus wilsonianus* (Lesson). LONG-EARED OWL (366).

A rather rare permanent resident, not found in some parts of the Swamp, perhaps because of the abundance of the Barred Owl, which is known to prey upon some of the smaller species of its family. Mr. Netting took a male with enlarged testes near Atlantic on March 28, 1926. It had evidently spent the winter in the dense hemlocks thereabouts, for the ground was strewn with hundreds of pellets. Another individual (perhaps a female) was seen on the same date. The stomach of the specimen taken held remains of field-mice. Mr. Welshons took a mated pair near Conneaut Lake on April 1, 1914. Mr. Kirkpatrick secured one near Meadville on May 16, 1897, and found a nest with three well-developed young on May 12, 1924, "about four miles up the Cussewago Valley," north of Meadville.

We saw one at Atlantic on June 30, 1927, but found no nest; on July 1 one was seen north of Hartstown in the dense hemlock grove. One Long-eared Owl was seen by us at Crystal Lake on September 20, 1925.

That this species regularly occurs the year round is more or less conjectural, although it is thought to be non-migratory in other parts of western Pennsylvania.

107. *Asio flammeus* (Pontoppidan). SHORT-EARED OWL (367).

A rather rare migrant and winter resident, which has been known to nest once in the present region. It may have occurred more commonly as a summer resident in former years than it does now. During the winter of 1925-1926 it was fairly numerous at the head of Conneaut Lake, and Mr. Langdon took one female from a flock of nine seen on January 25, 1926. I saw one about four miles north of Hartstown on February 19, 1925. Mr. Welshons took specimens at Conneaut Lake on March 17, 1914 (male), and April 10, 1911 (female), and we observed three at a little cat-tail marsh in the open farming country north of Hartstown on March 31, 1926. These dates probably mark the first of the spring migration. One seen near Hartstown on May 4, 1922, may have remained to breed, but it was probably a tardy migrant. Mr. Kirkpatrick tells me that Mr. Edgar Huidekoper and Mr. John E. Reynold of Meadville "found a marsh owl's nest about April 20, 1906," while they were hunting snipe. This nest, which was placed on a tussock of grass, and which contained six white eggs, under the circumstances can hardly be referred to any other than the present species. Both Mr. Huidekoper and Mr. Reynold were well acquainted with nests of the Marsh Hawk.

It is apparently somewhat commoner in fall than in spring. Mr. Kirkpatrick has the following Meadville records: October 22, 1905; November 10, 1896; November 28, 1913; December 7, 1895. A specimen which was taken near Conneaut Lake on October 30, 1925, was preserved by Mr. Kirkpatrick.

108. *Strix varia varia* Barton. BARRED OWL (368).

A locally abundant permanent resident, especially at Pymatuning Swamp, where it nests in the deeper woodlands. It is common also in the deciduous woods of the higher regions, especially just west of the Klink farm near Hartstown. A mated pair which were seen and

heard here on February 18 and 19, 1925, were doubtless preparing to nest in a huge hollow tree in the wildest part of the woods. Mr. Welshons took a male at Conneaut Lake on April 10, 1924, which showed every sign of breeding activity. Mr. Kirkpatrick tells me that a Mr. Cook found a nest just ready for eggs on March 1, 1906, on "Round-top," the local name for a high foot-hill of the Alleghany mountains that marks the northern intersection of the Cussewago and French Creek valleys north of Meadville. This nest was in an old crow's nest in a pine tree, and when first found contained one egg. At intervals thereafter an additional egg appeared until five were deposited. Incubation lasted about three weeks. The adults were so combative, whenever Mr. Cook climbed the tree, that he took a club with him for protection. Owing to the lapse of time in depositing the eggs, the young, which were reared in confinement, varied greatly in size.

We did not find a nest with eggs; but on May 17, 1925, Mr. Bergstrom and I found a parent bird and three almost fully fledged young in a woodland near Meadville Junction Pond. The young were sitting close side by side in a high tree, and peered down at us in a very amusing way. White-breasted Nuthatches which had a nest nearby scolded continuously.

The diurnal hooting of these big owls was more than once noted, and on September 14, 1925, three were heard at once in a weird and discordant chorus. The Barred Owl is apparently the enemy of all the smaller owls. On May 31, 1923, a Barred Owl was seen chasing a Screech Owl, the smaller creature crying out in mortal terror. One killed on May 12, 1922, had the remains of a Screech Owl and a Field Mouse in its stomach. The result of the big Owl's cannibalistic habits is that there are virtually no Screech Owls anywhere in Pymatuning, and when they do occur they almost never call. So far as I have been able to determine, the Great Horned Owl never preys upon the smaller owls, and I offer no evidence that the Barred Owl ever captures the Barn, Long-eared, or Short-eared Owl.

109. **Cryptoglaux acadica acadica** (Gmelin). SAW-WHET OWL (372).

This small and retiring species may be much commoner than is supposed, and, while we have but one questionable record of its breeding locally, it is probably a fairly regular permanent resident, occasionally

commoner in winter, when birds from the north are forced southward in search of food. On March 28, 1926, we found the scattered remains of a Saw-whet Owl along the railroad track near the humus-plant north of Hartstown. Probably this bird had been struck by a train, and subsequently eaten by a skunk or other carnivore. Mr. W. W. Andrews saw one on November 15, 1923, in the aspen trees not far from Crystal Lake. A visiting hunter shot one near Lower Lake on November 20, 1924, and brought it in to the Century Inn at Hartstown where Mr. and Mrs. Hutchens examined it. The torn remains of this specimen were later taken from a cat. Mr. Harry VanCleve, Trapping Instructor of the State Game Commission, who is well acquainted with this species and the larger Screech Owl, saw what he believes to have been a family of young birds flying about a camp-fire at French Creek, near Meadville on July 9, 1925.

110. *Otus asio nævius* (Gmelin). SCREECH OWL (373).

A very rare permanent resident at Pymatuning Swamp, where the Barred Owl constantly preys upon it; somewhat commoner in the outlying regions, and often fairly common in the towns, where it seems the Barred Owls do not pursue it. Screech Owl remains were taken from a Barred Owl's stomach on May 12, 1922. One was seen near Hartstown on May 22, 1922. Mr. R. E. Hutchens sent me a male in the gray phase of plumage, which had been taken near Hartstown on March 7, 1925. It was found in a trap by Mr. Wildrick who kept it in captivity for a short time. On the evening of August 24, 1925, we heard two near Atlantic. Mr. Welshons took a male near Conneaut Lake on September 14, 1911. Mr. Bergstrom recorded it on October 30, November 7 and 28, 1925, and on January 15, 1926, at Shermansville, where it appears to be locally common. Mr. Kirkpatrick found a family of fully fledged young at Meadville on July 18, 1914. I am certain that the Screech Owl nests in certain of the smaller woodlands in the farming districts about the Swamp, because reliable observers have seen and heard them during their "song" seasons.

Mr. Kirkpatrick states that one was captured alive by Mr. Charles Shaw of Vernon Township on November 21, 1910, in a pigeon-house. The owl had been feeding upon squabs.

111. **Bubo virginianus virginianus** (Gmelin).
GREAT HORNED OWL (375).

An uncommon permanent resident found in the deeper parts of the wooded swamplands, particularly where there are dense hemlocks, and in the tall timber of the outlying regions. Mr. Crumb found a nest with two fresh eggs near Linesville on March 8, 1895. On May 16, 1922, I found a half grown young, not well able to fly, on the ground in an open woods about three miles west of the Swamp. When I picked it up the parent (probably a female, since it was very large) swooped at me menacingly, and snapped her beak between fits of angry grunting and shrieking. The commotion quickly aroused the Crows and I heard the noise of their mobbing of that young bird for days afterwards. It is no wonder that intense hatred exists between these two species. In the woodland where this young bird had been reared was evidence that it had probably been fed more than once upon Crows. On May 17, 1923, I came upon two half grown young about thirty feet below their nest in a hemlock, a mile north of Hartstown. The parents were not seen. Mr. Kirkpatrick has seen nearly fully grown young on May 8, 1880, and May 18, 1920, near Meadville, and he prepared an immature specimen taken on June 15, 1926, near Meadville. On September 4, 1925, I suddenly came upon an adult bird dozing in the sunlight only about eight feet from the ground. I had the rare experience of touching the creature before it flew off.

During March, 1926, several Great Horned Owls were seen. Judging from the remains strewn about the bases of the hemlock trees numerous rabbits and some Ruffed Grouse had been eaten. A Great Horned Owl that was being mobbed by Crows on March 30, 1926, was actually knocked off its perch by a blow from an attacking Cooper's Hawk, which apparently had a nest nearby.

112. **Nyctea nyctea** (Linnæus). SNOWY OWL (376).

A rare winter visitant, for which we have but few records prior to the notable invasion of the species, which occurred in the winter of 1926-1927. Mr. Kirkpatrick has mounted two specimens taken in the region; November 18, 1918, near Atlantic, and November 28, 1913, Blooming Valley, six miles east of Meadville. Mr. C. R. Jones of Hartstown killed one during the late winter of 1919-1920 near Shakleville. This specimen was preserved and examined, but I have not

been able to secure more definite data. Mr. Edgar Huidekoper took a specimen in the early spring of 1885 at Edinboro Lake in southern Erie County, but the exact date has been lost. Mr. Langdon shot a large female on February 11, 1925, along French Creek near Meadville, just after it had killed a muskrat. There is a specimen in the Century Inn at Hartstown which was taken in the vicinity of Espyville many years ago.

During the winter of 1926 Snowy Owls appeared in Crawford County in November. A female was taken at Titusville by Mr. Augey Bond on November 12. On November 16 Mr. Welshons saw two very white birds near Conneaut Lake, one of which, a female, he collected. The other was taken by Mr. Brad Kean, while he was traversing his trap line. On November 18, two specimens were taken at Titusville by Messrs. P. Nikols and J. M. Wales, respectively. Both birds were pursuing chickens. Mr. T. W. Robishaw took one near Spartansburg on November 23; Mr. W. S. Strickland took a male near Centerville on December 4; Mr. H. Westcott took a female at Conneaut Lake on December 7, and a male on December 9; Mr. E. H. Hulbert took a female at Westford on December 10.

The stomachs of all these birds were empty save that of the female taken by Mr. Bond at Titusville; the stomach of this bird held grouse feathers.

113. *Coccyzus americanus americanus* (Linnæus).

YELLOW-BILLED CUCKOO (387).

A rather uncommon summer resident, much rarer than the succeeding species; a migrant also, since some individuals pass on to the northward to nest. Mr. First recorded its vernal arrival at Meadville in mid May: May 15, 1907, and May 18, 1908. Mr. Langdon recorded it on June 2 and 10, 1926, near Conneaut Lake. Mr. Kirkpatrick has not often seen it, although he found a nest with eggs near Meadville on May 29, 1896. I found a nest with four half-grown young near Hartstown on June 29, 1927. The nest was seven feet from the ground in a wild apple-tree. We saw it occasionally in the spring of 1922, and three times in the fall of 1925 near Crystal Lake: August 22 and 25, and September 24. By October 1 it has probably departed for the south. One Black-billed Cuckoo nest, found on May 28, 1922, may have held an egg of the present species. The Yellow-billed Cuckoo seems to be somewhat restricted to the old orchards

and deciduous woods of the higher country, while the Black-billed Cuckoo is found in the black alders and characteristic low growth along the edge of the Swamp.

114. **Coccyzus erythrophthalmus** (Wilson).
BLACK-BILLED CUCKOO (388).

A rather abundant migrant and summer resident, occurring in the Swamp most commonly in the shrubbery about the lakes, and in the upgrown borders of woodlands, often near the roads. It arrives in early and middle May: May 7, 1909 and 1910, Meadville (First); May 12, 1922, Hartstown (Sutton); May 17, 1908, Meadville (Kirkpatrick); May 22, 1914, Meadville (First). Within the following week nests are constructed. I found a nest and two eggs near Hartstown on May 20, 1922. Another nest with one egg was found in a low maple near a Green Heron colony east of Adamsville on May 23, 1922. A set of three eggs collected on May 25, 1922, was so badly incubated that the specimens were ruined. A nest and four eggs were collected on May 28, 1922, only three feet from the ground, in a maple-sapling, which grew along a roadside leading west from Hartstown. On May 31, 1924, a fresh egg was found on the ground between railroad-ties. Mr. Kirkpatrick found a nest with two eggs and one small young one near Meadville on June 2, 1900, this being our only date for the hatching of the young. Young birds in the nest (probably a first brood of the year) were still being fed by parents on August 28, 1925, and both the adult male and female were in very poor plumage. These young, fully fledged and in beautiful feather, were seen on September 11. Black-billed Cuckoos were seen quite commonly until September 23, 1925, on which date but one bird was noted.

115. **Streptoceryle alcyon alcyon** (Linnæus).
BELTED KINGFISHER (390).

Common as a migrant and summer resident, save at Pymatuning, where there are almost no banks suited to its nesting; casual in winter. Mr. Kirkpatrick has several interesting records for the vicinity of Meadville, which indicate its winter occurrence or at least its very early appearance in spring and tendency to linger in fall: December 16, 1891; December 26, 1893; February 23, 1897; February 26, 1901; March 6, 1894. The last may be considered as an arrival date, it seems to me, although we did not see one before March 30 in 1926

(Linesville) and Mr. Bergstrom did not see one at Shermansville until April 13 in 1925. By mid April all the local summer residents are on hand digging their burrows. Finding a nesting site is not usually difficult for this species, but at Pymatuning clay banks are so rare that for a time I was on the point of searching for their nests in hollow trees. However, on May 12, 1922, I found a burrow containing seven eggs in a cut of a road at least half a mile from any water. On May 20, 1922, another nest containing seven eggs was found in a low bank (scarcely three feet high) along the road which crosses the southern end of the Swamp below Hartstown. On May 16, 1925, another nest was found in almost the identical spot. Mr. Kirkpatrick found a nest near Meadville on May 14, 1898. A male was collected on May 20, 1922, and a highly colored female on September 17, 1925 (Bergstrom). It was seen throughout the fall of 1925, and there is no doubt that it generally remains until Christmas, if the water is sufficiently open, although most individuals pass to the southward in November.

116. **Dryobates villosus villosus** (Linnæus).

HAIRY WOODPECKER (393).

Although this species occurs the year round, it is sometimes rare in winter. This naturally suggests the possibility that migration takes place. Winter specimens observed from February 18 to 21, 1925, were certainly very white in appearance, although it seems hardly likely that the northern form *leucomelas* should move thus far southward. Two males and one female taken on March 28, 1926, certainly seem to be typical *villosus*. They are all rather soiled and their sexual organs showed signs of activity.

The Hairy Woodpecker occurs only rarely in the higher deciduous woods outside the borders of Pymatuning during the nesting season, but it is abundant everywhere in the wooded Swamp, and in the restricted area, closely examined in 1922, was considered one of the most numerous species. Often in one small group of high dead trees two or three nests with young were found, and I am inclined to think that there is a tendency among the breeding birds of southwestern Crawford County to congregate in the Swamp.

During latter April, 1922, the birds were all apparently mated and nests were being drilled. Odd mating antics were often observed, and it was thought, even up to the middle of May, that the birds were not finally mated, and therefore that egg-laying had not yet com-

menced. All doubt was dispelled, however, when a high stub was climbed on May 18 and a nest filled with young birds about half-grown was found. In our attempt to find a nest with eggs we failed completely, although twenty-six nests with young were found by the end of May! The cavities were drilled near the tops of dead trees which nearly always stood in water. It was impossible to climb many of them because their bases were weak; but the clamoring of the young birds could be heard some distance away. On May 30, 1922, I located six nests within a half hour by watching the parent birds and listening for the young. The deciduous woods about the Swamp were carefully searched for nests. Only one was found, in a high oak on May 29, 1923, near Stewart's Corners. Quite plainly all the local residents have found the Swamp an ideal nesting-ground. Mr. Kirkpatrick found young birds just leaving the nest on May 13, 1899, at Meadville. Nests found May 16, 1925, May 25, 1922, and May 29, 1923, each held five almost fully developed young. On June 18, 1923, an adult male, and a fully fledged young male, which was searching for food like an adult, and with crown beautifully sprinkled with red and white, were secured.

From the abundant notes at hand it may safely be stated that mated pairs begin drilling their nests with the first warm days of spring, probably in latter March. By April 15 probably all the first sets of eggs have been laid, so that during the ensuing three weeks young birds may be looked for. If one would find the eggs of this species in this latitude he must, therefore, search early. Probably second broods are occasionally reared, although this may depend upon the success of the first brood.

The parents fed their young grubs of some sort during our observation of them in 1922. An adult male secured on June 18, 1923, had a large grub sticking to its tongue when it was shot. This proved to be the larva of an Elaterid beetle.

The twenty-six nests averaged roughly over thirty feet from the ground. Only about one-fourth of these were examined, because of the time and effort required in making such difficult ascents. On May 23, 1922, a male bird was discovered drilling a cavity, but this subsequently proved to be quarters in which he spent the night. This cavity was only about twenty feet from the ground in a maple tree.

The Hairy Woodpecker is much more common than the Downy Woodpecker during the nesting season, and only very few nests or

nesting pairs of the latter species were found. During the winter, however, according to the notes at hand, the Downy Woodpecker is fully as common as the Hairy Woodpecker, if not more so.

117. *Dryobates pubescens medianus* (Swainson).

DOWNY WOODPECKER (394c).

A permanent resident, apparently more constant in numbers throughout the year than the Hairy Woodpecker. Mating and nest-building also apparently takes place later in the spring than in the case of the Hairy Woodpecker, since on May 1 and 2, 1922, nesting cavities of the present species were found only partly completed, while nearby the finished nests of the Hairy Woodpeckers held many incubated eggs or small young. A male with somewhat swollen testes was taken at Hartstown on March 27, 1926. On May 9, 1922, a breeding male was shot, and on the same date a set of five fresh eggs was collected near Hartstown. During 1922 only six pairs were located, nests of all of which were found and examined. On May 13 a newly completed cavity was found. On May 23 this nest held a complete set of four eggs which showed signs of incubation. A nest first found on May 31 held half-grown young. The female parent was very solicitous, spreading her wings wide and hanging head downward from the bark while calling sharply. Of the six nests found this was probably the first to be drilled.

During 1922, as above stated, twenty-six nests of the Hairy Woodpecker were found and only six of the Downy Woodpecker. During the winter, however, the Downy Woodpecker is apparently in the ascendancy and is a characteristic and common member of the wandering flocks of birds which forage through the trees.

118. *Sphyrapicus varius varius* (Linnæus).

YELLOW-BELLIED SAPSUCKER (402).

Although this species nests in limited numbers and is occasionally recorded in winter, it occurs chiefly as a transient visitant, arriving early in the spring, and remaining until rather late in the fall. The male seen at Hartstown on February 20, 1925, must be regarded either as a winter resident, or an exceptionally early arrival, since snow covered the ground at the time and the sap was certainly not flowing. At Meadville Mr. First often has recorded it during the first week of April; Mr. Kirkpatrick's first date is April 18, 1898. In

1922 numbers of the birds were seen from April 28 to May 19, on which latter date a male was shot. During the last week in May their numbers diminished noticeably. In late May and June the mewing cry was familiar and they occasionally indulged in strange courtship antics, flashing through the tops of the trees, calling excitedly in tones resembling those of a Flicker, and dancing about with wings and tail spread in a manner utterly foreign to the usually stolid bearing of migrant individuals. While a nest was searched for in the suitable tamarack growth during 1922, it was not until June 16, 1923, that one was found in a wild portion of the Swamp northwest of Shermansville. Here the male was seen to go to the hole in a dead hemlock stub where he fed the female bird as she brooded over what I believe to have been her small young. I did not cut the cavity open, since I feared this would cause the birds to desert. The feeble buzzing cries sounded like those of young birds. This nest was situated about twenty feet from the ground. The tree stood somewhat in the open, near a number of living tamaracks. The parent birds moved quietly about the nest and did not make any loud demonstration, when I climbed to examine the entrance.

The discovery of this nest made it evident that at least two other mated pairs, which were observed in latter May, 1922, also had nests or were selecting nesting sites, since their actions and surroundings were in every way similar to those of the nesting individuals already observed. A mated pair were seen northwest of Linesville on May 17, 1925, and a pair were noted between Linesville and Espyville on July 1, 1927, in willow trees. A juvenal male was secured from a family of six young on September 1, 1925, one mile north of Hartstown. The moult was by no means complete.

Mr. Harry Kirkpatrick once found them breeding near Meadville. This record has been cited by Warren (*Birds of Pennsylvania*, 1890, 169). Mr. Todd on June 28, 1899, saw a pair near Hartstown, which must have been nesting.

In the fall the migrants from farther north do not usually arrive until the moult of the local juvenals is complete. Therefore it is presumed that young birds and adults seen on September 2, 3, and 7, 1925, were local summer residents. On September 17, however, there was a noticeable influx of new birds, most of which were certainly migrants, for they occurred where local residents had never been seen. They were abundant until the end of September. Mr. Kirkpatrick's

latest date for Meadville is September 27, 1914. Mr. Bergstrom saw one near Shermansville on October 15, 1925. This is our latest fall date.

119. *Phlœotomus pileatus abieticola* (Bangs).

NORTHERN PILEATED WOODPECKER (405a).

(Plate II.)

A rare permanent resident, which is doubtless nearing extinction, although a few pairs live in Pymatuning and in the high, deciduous woods adjoining. It was formerly quite abundant; but it has been so thoughtlessly shot for sport and food, and its native large timber has been so wiped out that it is rapidly disappearing. If the gunners would absolutely stop shooting at the birds during the hunting season this species might become quite common. While I knew the birds had been recorded by Mr. T. Walter Weiseman of Emsworth, Pennsylvania, who found them in 1921, it was not until April 30, 1922, that they were seen by us. At this time a pair of the birds flashed across the Swamp, high in air, their white wing linings gleaming. On May 6 one was again seen.

On May 16, 1922, I found a nesting cavity which had been occupied during the preceding May according to the farmer who owned the land. On this date I saw a mounted specimen in immature plumage which had been killed at the Swamp three years previously in November.

On May 18, in a wood west of Pymatuning and north of Hartstown a nesting cavity just being dug was found. It was in a huge tottering dead stub. I think that my interference caused the shy birds to desert, for they were not seen again, and a Tufted Titmouse later occupied the great orifice. Workings of the big "Log-cocks" were seen several times, and chips three inches long were not unusual. The birds themselves were only rarely seen, but more often heard.

Once I saw a male bird at close range drilling in a stump only a few feet from the ground. Upon my approach he flew noisily away through the woods and I could not find him again. An occupied cavity found on May 29, 1922, may have held eggs or young, but I could not reach it, since I did not have climbers or rope.

The birds are especially noisy and noticeable in the fall, and they are well known to local sportsmen, who can distinguish the young birds by their grayish crests. Mr. Kirkpatrick had specimens brought to him on November 6, 1905.

In 1925, on May 16, a mated pair and their nest were located in the Swamp a little south of Linesville. It is regrettable that it was not possible to spend more time with these birds, although they were so shy that I hesitated to disturb them. In the fall of 1925 at least four juvenal birds were seen near Hartstown on August 22.

120. **Melanerpes erythrocephalus erythrocephalus** (Linnæus).

RED-HEADED WOODPECKER (406).

A fairly common, but somewhat irregular, migrant and summer resident, occurring from latter April until October not only in the high dead stubs in the Swamp, but in the deciduous woods throughout the region, particularly along the outlet of Conneaut Lake, and in the open farm country west of Pymatuning.

The bird rarely arrives before the first of May. Mr. First saw one near Meadville on April 16, 1913. He saw it on May 2 in 1913, and on May 9 in 1914. Mr. Langdon recorded the first one on May 3, 1925. I am certain that they did not arrive before May 8, in 1922, and Mr. Langdon saw it first on May 10 in 1926. Nest building was commenced at once in May, 1922, and a partly drilled cavity was discovered on May 10, 1922, with the birds hard at work. At least seven nests were located in 1922, all of which were in high, dead stubs, mostly oaks. In one large tree were two nests, and the parent birds fought constantly. According to Mr. Bacon (Todd, *Birds of Erie and Presque Isle*, 1904, 560) the species occasionally occurs in some numbers during the winter as far north as Erie, so that it may be expected at that season in this region also, as Mr. Kirkpatrick's Meadville record for January 10, 1884 (two birds seen), tends to show.

My impression is that this species drills in harder wood than any other species of woodpecker. It spurns the soft wood of the dead hemlocks and black birches, and selects the toughest oak, which is extremely hard to cut with a knife or hatchet. A nest found May 22, 1922, doubtless contained eggs, but I could not cut out the cavity with the implements at hand. Mr. Kirkpatrick found two nests containing respectively four and seven eggs on June 3, 1893, at Meadville.

In the fall of 1925 juvenal birds were observed throughout August and September. By September 27 but few were seen and Mr. Bergstrom saw the last one on October 4, near Shermansville.

121. **Centurus carolinus** (Linnæus).
RED-BELLIED WOODPECKER (409).

A rare, and somewhat irregular permanent resident, occurring in the deciduous woods at the edge of the Swamp. It was first recorded by us on May 2, 1922, at Stony Point, where I believe there was a nest. On May 28, 1922, a pair were seen in the high oaks northwest of Hartstown. These birds also doubtless had a nest, although continued search failed to reveal it.

Not until May 16, 1923, was a nest actually discovered. The site was unusual. Not ten feet above the old hole of a Pileated Woodpecker, and on the opposite side of the tree, the birds had drilled. At this time there were probably eggs, since the male bird was feeding the female. I attempted to reach the cavity by felling a nearby tree, but was not successful. On August 25, 1925, a pair with three young were watched for an hour or more, in a wood about two miles northwest of Hartstown. They were seen again on September 2. On February 18, 1925, three birds were recorded in this same wood. This is the final proof that the birds are resident throughout the year.

Mr. Kirkpatrick once recorded the species in the vicinity of Meadville, on May 18, 1892. It has never been seen in the Swamp proper, although it is apparently much commoner about Pymatuning than it is a few miles farther east. As the vegetation changes and the northern forms recede, this woodpecker, along with the Cardinal, Tufted Titmouse, Barn Owl, and other southern forms will doubtless become increasingly common. Mr. Langdon noted it several times during May, 1926, near Conneaut Lake.

122. **Colaptes auratus luteus** Bangs.
NORTHERN FLICKER (412a).

An abundant migrant and summer resident throughout the region; casual in winter. Mr. Kirkpatrick has two winter records for Meadville: January 4, 1894, two seen; January 5, 1882. Two were seen on February 11, 1927, north of Hartstown. It customarily arrives late in March and early April: March 22, 1910, Meadville (First); March 28, 1908, Meadville (Kirkpatrick); March 29, 1926, Conneaut Lake (Langdon); April 4, 1913, Meadville (First); April 8, 1898, Meadville (Kirkpatrick). By the end of the first week in May nesting cavities are completed and some of the eggs laid: May 9, 1922, three

eggs, Hartstown (Sutton). Full sets of eggs are to be found thereafter during May. Nests with seven and eight eggs were found on May 10 and 24, 1922, respectively, at Hartstown. The latter set was collected. Mr. Kirkpatrick found sets of eight and five eggs on May 15, 1898, and May 23, 1892, respectively. A nest with small young was found near Hartstown on May 31, 1924. On May 23, 1925, Mr. Langdon found two nests at Conneaut Lake with the young just leaving. In the towns Flicker nests were found in all sorts of situations, some in the gables of houses. In the Swamp, however, all nests were drilled near the very top of the highest dead stubs, in situations which were difficult to reach.

In the fall Flickers are abundant as a rule until November, and they may remain until Christmas, if the weather is not severe; but we have no actual records after October 18, 1925, on which date Mr. Bergstrom saw several near Shermansville.

On September 21, 1925, Mr. Bergstrom shot an adult female, which had large cancerous growths at the base of the bill and on the feet.

More than once it was noted that the courtship antics, or at least evidences of instinct to play, are not restricted to the spring season. All through latter September, 1925, the birds of the year and others were observed bowing and dancing in the style usually associated with the nesting season.

123. *Setochalcis vocifera vocifera* (Wilson).

WHIP-POOR-WILL (417).

An uncommon and local summer resident from latter April until early fall (no September records); not recorded from the Swamp, but from the woods about the Swamp and Conneaut Lake. Mr. Todd recorded it as fairly common near Hartstown on June 16, 1898.

April 24, 1925, is our earliest record of arrival. This bird was observed for several days by Mr. Bergstrom near Shermansville, where it came about the farmhouses and sang loudly and insistently very early in the morning. At Meadville Mr. First saw one on May 10, 1907; Mr. Kirkpatrick's earliest date is May 13, 1902. In 1922 it was first recorded near Shermansville on May 2, and two pairs were observed in the deciduous woods northwest of Hartstown until May 31, at which time two young birds were found about two miles west of Stewart's Corners (Sutton). During 1922 so few were found that I considered the species very rare, but careful search in 1925 revealed

several patches of woodland which I had never before visited where the birds were nesting. On June 30, 1927 we heard one north of Hartstown.

We have but one fall record. Mr. Langdon saw one on August 24, 1925, near Conneaut Lake.

124. *Chordeiles minor minor* (J. R. Forster).

NIGHTHAWK (420).

A common migrant and rare summer resident, which is sometimes, particularly in early fall, amazingly abundant. It arrives in mid May: May 10, 1909, Meadville (First); May 22, 1922, Crystal Lake (Sutton); May 25, 1926, Conneaut Lake (Langdon); May 26, 1902, French Creek (Kirkpatrick). Mr. Langdon saw hundreds of birds circling about Conneaut Lake on May 28 and 29, 1925. As late as May 31, 1924, we saw small flocks instead of pairs near Hartstown, so it is likely that nesting does not commence until the middle of June. Mr. Kirkpatrick observed courtship antics at Meadville on June 18, 1921, in the vicinity of the Federal Building on Chestnut Street where he believes that they nested. He found in the collection of a small boy a single egg, which had been taken late in June, 1889, at the Meadville Stone Quarry.

Nighthawks are much more noticeable in early fall than in spring and summer. The first fall dates of all observers agree remarkably. I saw two on August 22, 1925, at Lower Lake. Mr. Kirkpatrick saw a flock at Meadville on August 22, 1922. Mr. Bergstrom saw great flocks, indicating the height of the migration, on August 24, 1925. Mr. Kirkpatrick saw them on August 25, 1923, August 26, 1921, and August 30, 1924. In 1925 we saw three flocks on August 30 at Crystal Lake, our latest record. Flocks, which I observed on August 25, 1925, (there must have been at least a hundred flocks, totalling probably ten thousand birds), were not all moving southward. Most of the flocks came from the southwest and moved northeast. Flocks seen on August 26 passed rapidly to the south.

125. *Chætura pelagica* (Linnæus).

CHIMNEY SWIFT (423).

A common migrant and fairly common summer resident, not known to nest in the hollow trees at Pymatuning, apparently preferring the chimneys of the nearby towns. It arrives from late April to the first

of May: April 25, 1900 and 1902, Meadville (Kirkpatrick); April 28, 1925, Shermansville (Bergstrom); May 1, 1922, Hartstown (Sutton); May 2, 1926, Conneaut Lake (Langdon); May 5, 1909, Meadville (First). Most of the birds did not arrive until May 8, in 1922, although two were seen on May 1. Three pairs nested at Hartstown in 1922, but none of the nests was examined. Mr. Kirkpatrick found a nest with five young at Meadville on July 12, 1893. Parent birds were feeding young during the latter part of June and early July, according to residents of Hartstown.

In the fall migrants arrive during the first week in September: September 8, 1921, Meadville (Kirkpatrick). During the fall of 1925 the movements of the birds were interesting. From August 20 to 25 they were numerous at Crystal Lake. From August 26 to September 10 not a Swift was seen anywhere, although I constantly watched for them. On September 10 four birds suddenly appeared from the north, dropped to the surface of Crystal Lake, where they sped about, and then passed to the south. Their primary feathers were so short that they flew with some difficulty and their wings made a rasping noise foreign to normal flight. On September 11 one bird was seen. Probably the great flocks, which are known to congregate before migration, do not move southward until later. Since no suitable roosting-place for such flocks exists in the locality, the Swifts disappear for several weeks before their final migration southward. The nearest point, at which I am certain these pre-migratory flocks gather, is Slippery Rock, Butler County.

126. *Archilochus colubris* (Linnæus).

RUBY-THROATED HUMMINGBIRD (428).

A common migrant and summer resident arriving in the latter part of April and early May: April 25, 1896, and May 2, 1901, Meadville (Kirkpatrick); May 4, 1922, and May 15, 1925, Hartstown (Sutton); May 18, 1926, Conneaut Lake (Langdon). Our numerous records for the latter part of May are thought not to accurately represent the time of arrival. On May 29, 1922, I found a female building her nest high in a beech tree, about two miles northwest of Hartstown. The finished structure was subsequently deserted and collected.

During the fall of 1925 Hummingbirds were exceedingly abundant, and one immature male was collected on August 31. They were very

pugnacious amongst themselves and chased chickadees, warblers, and woodpeckers, as well as large birds, whenever they came near, apparently purely in fun or malice. I last noted the bird at Crystal Lake on September 19, 1925. Mr. Kirkpatrick recorded it at Meadville on September 25, 1894. Hummingbirds are very fond of visiting Jewel-weeds (*Impatiens pallida* and *biflora*), and were consequently very commonly seen all through the wildest parts of the Swamp.

127. **Tyrannus tyrannus tyrannus** (Linnæus).

KINGBIRD (444).

A common migrant and summer resident, arriving occasionally in late April, but usually in early May: April 27, 1925, Conneaut Lake (Langdon); May 1, 1922, Hartstown (Sutton); May 5, 1908, Meadville (First); May 6, 1906, Meadville (Kirkpatrick); May 7, 1926, Shermansville (Bergstrom); May 9, 1926, Conneaut Lake (Langdon).

During 1925 we witnessed the arrival of the first migrants on May 17. The lateness of this date was due to the severe weather which had just preceded; we came upon at least twenty birds in a compact flock, all of them perched on or near the ground, and plainly worn out. Possibly these birds were temporarily retreating.

By May 6, 1922, all the local summer residents were present at Pymatuning, and by May 11 nesting-sites were being chosen. On May 12 a pair at Crystal Lake started a nest about ten feet up in an alder; on May 25 this nest was completed. On the same date four other nests just ready for eggs were found in widely differing localities in the vicinity of Hartstown. On June 2 three of these nests each held four fresh eggs, and one held three. One nest was placed in a very unusual situation, on a horizontal, protruding hawthorn branch only two and one-half feet from the ground. The bush grew in the open in a large pasture. Mr. Kirkpatrick found nests, each containing three much incubated eggs, on June 9 in 1893 and 1897, near Meadville. On July 1, 1927 a Kingbird with nesting material was observed near Hartstown.

The local families congregate somewhat, preparatory to going south in late August. Such a flock, composed mostly of immature birds, was seen August 31, 1925, at Crystal Lake. I saw one bird on September 4, and one on September 7, 1925.

128. *Myiarchus crinitus boreus* Bangs. CRESTED FLYCATCHER (452).

A common migrant and summer resident arriving in late April and early May: April 28, 1914, Meadville (First); May 2, 1922, Crystal Lake (Sutton); May 2, 1926, Conneaut Lake (Langdon); May 4, 1892 and May 9, 1901, Meadville (Kirkpatrick). It proceeds to build a nest almost immediately, although some pairs wait a little: May 5, 1922, a pair building, Dollar Lake (Sutton). A partly finished nest was found near Shermansville on May 17, 1923. Eggs were not found until late May and June: May 31, 1924, nest and six fresh eggs, Lower Lake (Sutton); June 16, 1923, nest and three eggs, incubated considerably, Shermansville (Sutton). This set was collected. During latter August, 1925, parents were still feeding young which were out of the nest. A female taken August 24, 1925, was in such poor feather, due to moulting, that she was not preserved.

I noted no tendency whatever toward flocking in the fall. In fact not even the families seemed to remain together noticeably. One bird was seen as late as September 7, and two were seen on September 9. It apparently stays but little later than the Kingbird.

Crested Flycatchers were most abundant about Crystal and Dollar Lakes, and on Ellis Island; but they were also found in the wildest portions of the Swamp, where almost no other species of Flycatcher occurred.

129. *Sayornis phœbe* (Latham). PHŒBE (456).

An abundant migrant and summer resident, appearing from the middle and end of March to early April: March 18, 1898, Meadville (Kirkpatrick); March 21, 1925, Conneaut Lake (Langdon); March 22, 1894 and 1903, and April 1, 1909, Meadville (Kirkpatrick); March 27, 1926, Hartstown (Sutton). Nests are constructed during late March and April, and by the first of May full sets of eggs usually have been laid. We found a nest with four eggs on April 30, 1922, east of Hartstown, on a bridge crossing Randolph's Run. On May 1 another nest with four fresh eggs was found, and on May 7 and 8 nests with five and three eggs respectively, the latter of which was in a box-car on the siding along the southbound tracks. On May 21 young birds were found in a nest at Mr. Louis Shaffer's cabin near Dollar Lake. On May 15, 1923, a nest and six eggs was collected west of Shermansville; on June 16, 1923, a nest with five highly incu-

bated eggs was found near Hartstown. All these nests were placed about man-made structures of some kind, excepting one which was built upon a shelf of rock along Jack's Run southwest of Hartstown. Mr. Kirkpatrick furnishes an interesting note concerning a nest found on May 9, 1901, under a bridge on the main line of the Erie Railroad, over which freight trains passed frequently: "The nest was located on the inside lower flanges of the beam about two feet from the rail. I noted that the old bird remained on the nest when long freight trains passed over the bridge. This nest contained five eggs, four of which were of the Cowbird."

In the fall Phœbes linger until mid-October, and sometimes later: September 23, 1925, common, Crystal Lake (Sutton); October 6, 1925, Shermansville (Bergstrom); October 16, 1923, Meadville (Kirkpatrick); November 26, 1921, Hartstown (Hunter).

130. *Nuttallornis borealis borealis* (Swainson).

OLIVE-SIDED FLYCATCHER (459).

A rare migrant, which may occasionally nest in the wilder portions of Pymatuning, although we have not found it in mid-summer. On May 18, 1926, Mr. Langdon saw one near Conneaut Lake. On May 31, 1924, I secured a male from the tip of a hemlock about a mile north of Hartstown. On the same date three others were seen, and this date may be considered as representing the height of the spring migration.

In the fall one specimen was taken on September 18, 1925; it was a male shot from the tip of a dead tamarack east of Lower Lake. This bird had not quite completed the moult of the chin feathers and was very fat. On September 29 and October 1, 1925, Mr. Bergstrom saw one individual near Shermansville.

The call-notes of the spring birds sounded like a subdued utterance of the "quip, quip" of startled Robins. They also gave the characteristic cry "pit, per-wheer" which is usually in spring the most noticeable thing about the bird in the field.

131. *Myiochanes virens* (Linnæus). WOOD PEWEE (461).

A common migrant and summer resident arriving during early and mid May: May 7, 1922, Crystal Lake (Sutton); May 9, 1914, Meadville (First); May 17, 1925, Dollar Lake (Sutton). In 1922 it did not become abundant until May 13, almost a week later than the day on

which the first bird was seen. On May 30, 1922, two nesting pairs were observed northwest of Hartstown, and one nest was found in a beech tree, so high on a slender branch that I did not climb to it. Mr. Kirkpatrick found a nest and three eggs on June 26, 1897, at Meadville. A nest, containing three half-grown young, found on September 8, 1925, at Hartstown may have been a second brood for the season, or the first set of eggs may have been destroyed. Adult male specimens were secured at Pymatuning Swamp on May 19, 1922, and June 15, 1923, and a juvenal male and female in good feather were secured north of Hartstown on August 28, 1925.

The juvenal birds in very loose flocks seemed to be migrating from September 10 on, in 1925, and were not observed exclusively in the deeper woods, where they usually occur. The last one was seen on September 24, 1925, Crystal Lake (Sutton).

132. ***Empidonax flaviventris*** (W. M. and S. F. Baird).
YELLOW-BELLIED FLYCATCHER (463).

A migrant, rare in spring, but abundant in fall. It is interesting to note how completely this statement agrees with that concerning the status of the species at Erie (Todd, *Birds of Erie and Presque Isle*, 1904, 563). We have but two spring records: Mr. Kirkpatrick took a male on May 30, 1910, at Junction Hill; I took a male near Crystal Lake on May 18, 1922.

In the fall it appeared during 1925 on August 25, on which date I saw one bird near Crystal Lake. It was thereafter common in the alder growth about the lakes, and two immature specimens (male and female) were taken on September 7. Thereafter it increased even more in abundance, and one adult female was taken near Lower Lake on September 21. On September 24 at least twenty were seen, so that it was likely common for at least a week longer, though we have no later dates.

133. ***Empidonax virescens*** (Vieillot). ACADIAN FLYCATCHER (465).

A fairly common but locally distributed summer resident, arriving in early May: May 7, 1922, Hartstown (Sutton). It nests only in the woodlands of the higher country, and not in Pymatuning Swamp proper, so far as is known. On May 14, 1922, I located four nesting pairs, all to the west of Pymatuning and Hartstown. By closely watching a female on May 26 I found a nest just ready for eggs parti-

ally suspended from a long, swaying beech limb. On May 30 the nest was complete. On June 3 it held three eggs. This nest, which was over twenty feet from the ground, was secured by making a huge tripod from three saplings bound together at one end. Though the branch was considerably shaken and swayed the female would not leave until I touched her. On June 17, 1923, two nests with three eggs were found. One nest was placed near the tip of a sweeping hemlock bough; the eggs in this nest were much incubated. The other nest, which held fresh eggs, was only six feet from the ground, in a small beech sapling. On May 31, 1924, another nest was found, just ready for eggs. Mr. Kirkpatrick's records for Meadville, June 9, 1893, June 26, 1909, and June 26, 1903, may all be considered as nesting records for that locality. Old nests were three times found on low-swinging hemlock boughs.

In the fall this species is almost impossible to identify, save by collecting specimens. However we are positive of three records for Hartstown (identification through call-note): August 22, August 25, and September 14, 1925. This call-note might be written "weece", energetically uttered.

134. **Empidonax traillii traillii** (Audubon). ALDER FLYCATCHER (466a).

Fairly common as a migrant and locally and irregularly abundant as a summer resident, known to nest at the following places: Pymatuning Swamp (throughout); Conneaut Lake (head); Conneaut Marsh (locally); Sandy Lake, Mercer County; and two other spots near Mercer, Mercer County.

The presence of this species in spring is announced by the characteristic explosive call-note, which almost merits being called a song: "Becky-weer". The first arrivals customarily perch in exposed positions and call constantly. It seems that but few observers, in spite of this noticeable call, have recorded this species, which is truly one of the most characteristic birds of Pymatuning. It arrives late in spring. It was not noted until May 23, 1922, on which date a male was secured about a mile southeast of Hartstown. The bird was calling from a dead stub, which protruded from the water. On May 24 others were seen, and on May 27 a pair near Schaffer's Pond. Thereafter the interesting creatures were seen daily, and observed closely, but no nests were found.

In 1923 I made particular efforts to find the nest. On May 31

four pairs were found almost at once in the vicinity of Hartstown and to the northward. On June 16 after hours of the most disagreeable searching through the tangle of alders about three miles south of Linesville, in the very midst of the wildest portion of the Swamp, I came upon a nervous, silent pair of the birds which I watched closely. I was given no clue by their actions, although I knew a nest was in the vicinity. Finally, just before leaving, I shot the male. Then, not ten feet from me on an upright alder branch I saw the nest, a beautifully built structure, completely hidden from all angles save mine alone. It was about three and a half feet from the surface of the water at the edge of a great clump of black alders. In it were two fresh eggs.

On June 18 I collected this nest and three eggs. On the same date I located seven additional pairs of the birds in the vicinity and collected two birds. The call notes given by the birds varied considerably. The principal cry of the male was "Becky-weer" or "Chickie-weer". Sometimes this call contained but two syllables and sounded like "phee-beer" or "pee-weer"; and sometimes it had but one syllable, always the latter with the *r* sound prominent at the end: "Wheer" or "Weer".

On May 30, 1924, I found several pairs, and for the first time noted that they frequented willows and wild-rose bushes as well as alders. A nest was finally found almost four feet from the ground, in a wild-rose bush. The parent birds were very solicitous for the one egg which was in the nest. The alarm note as given was "Wheep" or "Thleep" and it was so quietly given that at a short distance it would not be noticed at all.

During 1925 our spring trips were made too early for Alder Flycatchers, since none had arrived by May 17. But in the fall I had the good fortune to find another nest containing four fairly well developed young on August 21. This nest, characteristically placed in an alder, was about two miles west of Shermansville. On the same date an adult female bird was shot near Hartstown. A migrant was seen at Dollar Lake on September 8, and the last, so far as I can determine, since I could stay no longer in the vicinity, on September 23. I speak of the individual at Dollar Lake as a migrant because this species does not customarily occur at Dollar Lake, save during the period of migration; they do not nest there.

The distribution of the nesting Flycatchers about Pymatuning is a

most interesting study in ecology. The Wood Pewee depends upon high, shady trees; the Crested Flycatcher upon high, dead trees, whether shaded or not; the Phœbe upon rock-shelves or man-made, well-shadowed places; the Acadian Flycatcher upon low, swinging, shaded boughs; the Least Flycatcher upon more or less open aspen copses or old orchards; and lastly the Alder Flycatcher, definitely upon just such conditions as exist almost throughout Pymatuning Swamp, alder thickets, bordered by water, and free from large, shadowy trees. A map showing the distribution of the Flycatchers instantly shows most of the major ecological associations at a glance. The Kingbird alone is apparently rather independent of these narrow ecological restrictions; it nests either in dense alders, or in open orchards, and sometimes even on man-made structures, such as telephone poles.

Nesting Alder Flycatchers were seen at the head of Conneaut Lake on August 5, 1924. They were closely watched at Sandy Lake by Mr. Homer and myself on June 14, 1924, and on the day following were seen at two points just south of Mercer, Mercer County. At Conneaut Marsh it was seen and heard on August 22, 1925. It may with reasonable assurance be stated that wherever the prevailing characteristics of Pymatuning Swamp occur the Alder Flycatcher will occur also.

On June 30, 1927, it was noted that after all the other birds of the Swamp had ceased their singing, due to the coming of night, the Alder Flycatchers continued for some minutes after dark to give their full songs, and to utter slight notes of alarm or anger.

135. ***Empidonax minimus*** (W. M. and S. F. Baird).

LEAST FLYCATCHER (467).

A fairly common migrant, as a rule more noticeable in spring than in fall, and rather rare as a summer resident. Mr. Langdon recorded it on May 1, 1926, near Conneaut Lake. Mr. First's earliest record for Meadville is May 5. In 1922 we did not see it in the vicinity of Hartstown until May 9. I closely watched a pair during 1922 and finally located a partially constructed nest on May 29 in an old apple-orchard at Hartstown. On May 30 the building activities seemed to cease, and on June 4 when I left the swamp the set of eggs was incomplete. On May 31, 1923, I observed a pair in the same tree, but did not find the nest. On June 2, 1924, another pair were watched for some time in an aspen copse about three miles north of Hartstown.

Unquestionably this pair had a nest. The male called sharply during the hour that I watched them. The female after leaving did not reappear. Mr. Kirkpatrick's two records, May 16, 1902, and June 9, 1906, seem to indicate that the species breeds near Meadville. Mr. Todd saw a pair near Hartstown on June 25, 1895. Warren regarded this species as very common in Crawford County in the summer (*Birds of Pennsylvania*, 1890, 197). On July 2, 1927, a pair were noted near Linesville.

In the fall the Chebecs are often so silent that they are not noticed. However, I took one on August 28, 1925, and on August 29 Mr. Bergstrom secured a female, which had almost completed the moult. On September 12 three were seen and I took an adult in good plumage near Crystal Lake. The last one was seen on September 17.

136. **Otocoris alpestris alpestris** (Linnæus). HORNED LARK (474).

The taking of specimens by Mr. Sennett at Erie in February and March, 1875 (Todd, *Birds of Erie and Presque Isle*, 1904, 564) led me at once to suspect the occurrence of this bird in winter in the region. Not until February 20, 1925, however, did opportunity offer for satisfactorily comparing the reddish northern wanderers with the comparatively dull-colored individuals which regularly nest in the locality. Mr. Bergstrom and I wandered out across the fields northwest of Hartstown where flocks of the Horned Lark were calling softly. In one field was a male Prairie Horned Lark, chirping anxiously, and rapturously singing at intervals. In the next field were the larger, darker, and more reddish birds moving about in a compact flock. None of these was singing and the flight of one was a signal for all to fly. Their throats and superciliaries, also, were noticeably yellower. When the flock was finally chased over toward the singing Prairie Horned Lark he paid no attention to them whatever, and they flew off without him. It is regrettable that no specimen from the flock was taken, but they flew off to the westward and could not be again located. The specimens taken by Mr. Kirkpatrick in the vicinity of Meadville must be referred to the variety *praticola*.

137. **Otocoris alpestris praticola** Henshaw.
PRAIRIE HORNED LARK (474b).

A fairly common but locally distributed permanent resident, which has become more abundant during recent years with the opening up

of farming sections. Mr. Kirkpatrick's records for Meadville clearly indicate its presence throughout the year: March 4, 1892; March 9, 1898; April 12, 1894; May 18, 1891; September 16, 1894; December 8, 1896. He has taken several specimens, all of which are clearly referable to the present form. He knows of one nest which was found near Meadville, but no eggs were taken, and the exact date has been lost.

We have observed Prairie Horned Larks chiefly in the wide fields west of the eastern arm of Pymatuning Swamp. On February 18, 19 and 20, 1925, Mr. Bergstrom and I found mated pairs, the males of which continuously performed sky-flights. Mr. Langdon recorded the species at Conneaut Lake on March 11, 1925. Although we found no nests, we had the good fortune to see a family of three juvenal birds with their parents on August 22, 1925. The spotted breasts of these young were plainly visible even at a distance. On September 16, 1925, we found a family of seven birds six miles northwest of Hartstown, in flat stubble-fields.

That the Horned Larks congregate shortly after the nesting season is obvious. During latter September, 1925, large flocks of adults and immature birds were seen west of Adamsville on the hill-tops, and open fields. Doubtless the eggs are laid very early in spring, as elsewhere. A lone singing male nearly always indicates that the female is incubating her eggs not far away.

138. *Cyanocitta cristata bromia* Oberholser. BLUE JAY (477).

An abundant permanent resident, apparently migratory to some extent, since it is noticeably not so common in winter as during the nesting season. It is particularly abundant at the southern extremity of the eastern arm of the Swamp near Hartstown, and in the coniferous woodlands bordering the alder-thickets. It nests commonly about Crystal and Lower Lakes, and west of Linesville. An incomplete nest was found in a low white pine on May 2, 1922, about three miles east of Hartstown. Nests, each with sets of five eggs, were found on May 7, 12, and 22, 1922, and on May 22 another pair were found just building their nest. All the nests save one were built in hemlocks and pines. The nest found by Mr. Thomas on May 22, 1922, was high in a pine tree; it was being attacked by Crows and Mr. Thomas arrived just in time to save the set from destruction. Mr. Kirk-

patrick found nests, each with five eggs, on May 9, 1896, and May 19, 1919, at Meadville.

The call-notes of this species are always interesting, and sometimes very confusing. Their imitation of the scream of a Red-shouldered Hawk is so perfect that more than once I have been completely misled by it. Now and then they also produce sounds which are only remotely bird-like, reminding one much of the clicking of mechanical toys of some sort.

139. **Corvus brachyrhynchos brachyrhynchos** Brehm. CROW (488).

Abundant throughout the year, but irregularly so during winter, since a migratory movement of considerable extent takes place every year, during which the local summer residents are partly or wholly replaced by individuals from farther north. From February 18 to 20, 1925, Crows were abundant at the Swamp and it is probable that they were winter residents from farther north.

On April 10, 1925, Mr. Langdon thought he noted an influx of birds from the south and shot several. On April 22 Mr. Langdon found a nest and five eggs in Conneaut Marsh. On April 19 I found two nests partly finished, and on May 1 a nest and four rather well incubated eggs. Nests with eggs were found by Mr. Kirkpatrick at Meadville as early as March 28, 1898, and April 25, 1887. On May 7 a nest with four half-grown young was found three miles northwest of Hartstown. We observed young leaving the nest on May 31, 1924, near Hartstown.

Numerous specimens were shot, including one juvenal female in complete plumage, on September 21, 1925. Several specimens taken toward the end of March, 1926, were in good plumage, and the sexual organs showed signs of activity. One large and very handsome female taken on March 28 was actually larger and heavier than males taken at the same time. The ovaries of the large female were not developed. This naturally leads to the supposition that this female was a more northerly bird, which had not returned to her breeding range.

The stomachs held, among other items, remains of eggs of hens and of Towhees and Meadowlarks; frogs; corn, grass, and other vegetable matter; insects of various kinds. It was found that Crows near Linesville were living on the discarded infertile eggs from a poultry-farm. On one day (May 16, 1925) we found about twenty occupied nests, and had the rare experience of observing a flock of

several hundred birds, which we called up to us without any trouble whatever. There are Crow roosts in the vicinity of Pymatuning and Conneaut Lake, but their exact location is open to some question.

During the spring and early summer of 1926 Mr. Langdon examined twenty-eight stomachs of this species. Seventeen of these chiefly held grasses, grain, and other vegetable matter. Four held fish. Three contained remains of rabbits, evidently young ones; two held insects, and two showed evidences of eggs.

Sturnus vulgaris vulgaris Linnæus. STARLING (493).

At the present writing this introduced species has become almost as menacingly abundant in the Pymatuning region as it has in many sections of Pennsylvania to the eastward, and if it continues to increase, as it has during the past six years, it is certain to cause trouble. It is not yet, however, to be reckoned with as a serious enemy of the native cavity-nesting birds such as the Bluebird, Flicker, and Crested Flycatcher.

The first local record, in fact the first Crawford County record of which I can find any trace, is that of a single bird seen by us on April 28, 1922, near Shermansville. On May 31, 1923, we saw four flying over Hartstown. Mr. Kirkpatrick recorded one at Meadville for the first time on January 19, 1925. On February 18, 1925, we found them present in small numbers about the farms and orchards near Hartstown. On March 12, 1925, Mr. Langdon saw a pair at Conneaut Lake Park. From May 16, 1925, onward nesting pairs were observed several times. During the spring and summer of 1926 Mr. Langdon saw them, as he says "too frequently, everywhere". Mr. Bergstrom found three nests at Shermansville during April, 1926.

During the fall of 1925 they were seen sparingly about Hartstown and no pre-migratory flocking tendencies were noted. In 1926, however, Mr. Bergstrom saw flocks of a hundred associating with the hordes of Bronzed Grackles and Red-wings, which gather at the Swamp. He noted them in 1925 as late as November 3, and the probability is that they regularly spend the winter in this latitude.

140. ***Dolichonyx oryzivorus*** (Linnæus). BOBOLINK (494).

A transient visitant and fairly common, but local summer resident, occurring in the Swamp during the pre-migratory flocking season, but nesting only in the higher meadows of the adjoining farms. It has been known to appear in the latter part of April: April 26, 1913, and April 27, 1909, Meadville (First); April 30, 1906, Meadville (Kirkpatrick); but it usually arrives in early May: May 1, 1926, Conneaut Lake (Langdon); May 3, 1880, Meadville (Kirkpatrick); May 4, 1908, Meadville (First); May 4, 1922, Hartstown (Sutton); May 7, 1926, Shermansville (Bergstrom); May 10, 1925, Conneaut Lake (Langdon). It seems that the males arrive first by themselves,

and on the date of arrival several males customarily appear simultaneously. In 1922 we observed three males on May 4 at Hartstown. On May 7 many more were present, including numerous females.

On May 24, 1922, we watched a female building her nest in an open alfalfa-field west of Hartstown. On June 1 this nest and five fresh eggs were collected. During 1924 Bobolinks were much commoner than they had been during the two preceding years. In the vicinity of Hartstown they were known to nest in only two fields, and these fields, strangely enough, were the only ones where Henslow's Sparrows were found. Mr. Kirkpatrick found two nests, each with five eggs, near Meadville on May 22, 1896, and May 25, 1880.

In early August the Bobolinks begin to flock. On August 21, 1925, an immature male and adult female were taken from a small flock near Hartstown. The immature bird was in perfect plumage, while the adult female had about half completed the moult. By August 25 Bobolinks were very numerous; we counted over four hundred during one evening. These flocks were certainly augmented by transient birds, because the local summer residents were hardly so numerous. While these great flocks fed in the wheat-, oat-, and buck-wheat-fields during the day, they retired to the stretches of golden-rod and cat-tail in the Swamp to roost, and it was here, at about half past four in the afternoon, that the jolly, yellow-brown birds gathered, sometimes singing a little, but usually swinging down from above and trailing low over the cat-tails, until they found a suitable perch, calling, almost incessantly "weenk, weenk". They came to roost much earlier than the Red-wings, and in their arrival and departure moved about in noticeably smaller flocks, and often individually.

We observed Bobolinks in large flocks up to October 1, 1925, and they were heard passing over during the night. Residents of Hartstown saw small flocks on October 7. Mr. Bergstrom saw them last near Shermansville on October 10.

141. *Molothrus ater ater* (Boddaert). COWBIRD (495).

A fairly common transient visitant and summer resident, usually very rare in Pymatuning Swamp, because the Red-wing does not tolerate its presence. It arrives early in spring: March 22, 1894, Meadville (Kirkpatrick); March 28, 1926 Linesville (Sutton); March 29, 1914, and April 4, 1913, Meadville (First). On April 28, 1922, we saw one near Hartstown and a few individuals or small flocks there-

after. On May 7 a large flock of males and females was seen at Crystal Lake. On April 27, 1925, Mr. Langdon sent in a female, which was about ready to lay eggs. The earliest egg of a Cowbird was found on April 30, 1922, in the nest of a Song Sparrow. Thereafter eggs were found every few days, though never very commonly. On May 8, 1922, four males and two females were shot, all of which showed signs of breeding activity. The birds most constantly imposed upon by the Cowbird are as follows, in order of the number of times so parasitized: Song Sparrow, Yellow Warbler, Red-eyed Vireo, Oven-bird, Towhee, Phœbe, Chipping Sparrow, Field Sparrow, Scarlet Tanager (once), Cardinal (once), Chestnut-sided Warbler (once), Hooded Warbler (once), and Tufted Titmouse (once). It will be noted that such swamp-inhabiting species, as the Red-wing, Swamp Sparrow, and Northern Yellow-throat, are not included in this list. This, I believe, is due entirely to the decided stand that the Red-wings take against all Cowbirds. I saw a flock of Red-wings once pursue a female Cowbird until she was utterly exhausted and plunged into the water to escape. Her pursuers chased her to the edge of the Swamp then headed her off and forced her back to the opposite bank. I caught the bird and liberated her after she became dry. Nearly all Red-eyed Vireo nests found had eggs of the Cowbird in them, so that this species may be the most frequently parasitized of all, but so many more nests were found of the Song Sparrow and Yellow Warbler than of the Red-eyed Vireo, that the former species assume the apparent lead. On June 29, 1927, a young bird, just out of the nest, was seen at Hartstown.

In the fall Cowbirds are seen occasionally, but the Red-wings are so overwhelmingly abundant that Cowbirds seem rare by comparison. We saw a few almost every day near Hartstown from August 21 to September 22, 1925. Mr. Bergstrom saw small flocks at Shermansville as late as October 14, 1926, and October 20, 1925. It is probable that they remain later, and occasionally, even during the winter, since they have been recorded at this season with some regularity not far to the southward.

142. **Xanthocephalus xanthocephalus** (Bonaparte).

YELLOW-HEADED BLACKBIRD (497).

Mr. Kirkpatrick saw at long range, and without a glass, what he

believes to have been a pair of Yellow-headed Blackbirds⁹ on March 25, 1890, near Meadville. This occurrence is recorded by Warren (*Birds of Pennsylvania*, 1890, 213). In view of the unique coloration of this species, and of the taking of a specimen at Erie on August 22, 1896, by Mr. Samuel E. Bacon (Todd, *Birds of Erie and Presque Isle*, 1904, 566), it seems only fair to credit Mr. Kirkpatrick's ocular identification. The species is, of course, an accidental visitant from the west.

143. **Agelaius phoeniceus predatorius** (Wilson).

RED-WINGED BLACKBIRD (498).

An abundant transient visitant and summer resident; rarely recorded in winter. With the exception only of the Catbird it is the commonest bird of Pymatuning Swamp, and in the cat-tail marshes is, of course, the dominant species. It appears in early March: March 2, 1897, March 7, 1898, March 8, 1903, Meadville (Kirkpatrick); March 8, 1925, Shermansville (Bergstrom); March 10, 1925, Conneaut Lake (Langdon). Males only are noted as first arrivals, and it is possible that most of the breeding individuals do not arrive until the last of March or later. However this may be, we found six nests ready for eggs on April 27, 1922, so that during that season at least the summer residents must have been on hand since the middle of April. Mated males and females do not travel north together; but since the polygamous instincts of this species rather obviate the necessity for the elaborate courtship and mating antics in which some species indulge, the probability is that but little time is lost in the construction of nests after the arrival of the females.

On March 27, 1926, large flocks composed apparently of male birds, were seen near Hartstown. From these flocks were taken full adults in rich plumage, and numerous males in first breeding plumage. Brown-looking birds in the early Red-wing flocks are likely to be first year males rather than females.

During the five years of our field observation we located one hundred and ninety-seven nests of this species. Many others of course could have been found. Completed nests, ready for the first set of eggs, were found on April 27, May 1, May 4, and May 6, 1922. *First*

⁹Mr. Kirkpatrick's statement, directly quoted by Warren, unfortunately gives the impression that these two birds were collected. Perhaps this was a typographical error.

sets of fresh eggs were found on the following dates: May 1 (three eggs), May 4 (four eggs), May 6 (three eggs), May 10 (four eggs), 1922; May 17 (three and four eggs), 1923. Newly hatched young of the first brood were found on the following dates: May 4, 1922; May 15, 1923; May 16, 1925. Fully fledged young of the first brood were found on May 15, 1922. Incomplete nests or nearly finished nests for the *second* brood of young were found on May 25, 1922, June 18, 1923, and June 1, 1924. A nest with three small young found August 21, 1925, probably represents a third brood. An examination of these dates shows that, while there is a rather periodical appearance of fully fledged young of the first brood, and subsequent fresh set of eggs for the second brood, there is, nevertheless, a great deal of overlapping of dates. This overlapping is due to several factors: *First*, to the very early arrival of certain individuals, which, regardless of conditions of weather, apparently, begin to build nests at once. These nests actually have fresh sets of eggs before some of the summer resident females arrive; *second*, to the destruction of eggs, nests, or young, which, strange as it may seem, is not nearly so often due to predatory species of mammals and birds, as it is to the unequal growth of cat-tail leaves, which in at least twenty-four instances is known to have turned over nests with eggs and young.

By mid August flocking tendencies are everywhere evident. These early "family" flocks usually number from twelve to twenty. An adult male leads them about, and it seems likely that his followers are his various mates and their offspring. By carefully collecting specimens from such a flock on August 22, 1925, I determined that the leader was the only adult male in the flock; that there were several adult females, both the adult male and adult females being in about the same stage of the moult, and in very poor feather; that the bulk of the flock was composed of immature males and females, which were also in the moult, evidently assuming the plumage of the first winter; that, in addition to the immature birds, there was also a small percentage of juvenal birds (males and females) which upon examination proved to be not in the moult, but in perfect feather, save for their short tails (three specimens preserved, male and two females). Several flocks were subsequently examined, and virtually the same conditions were found. A month later other specimens were taken. In these latter flocks the adult birds were in much better plumage, though obviously still in the moult; young birds of the first brood

were now the most bedraggled in appearance, having about half of the immature and half-juvinal plumage. The black feathers of the immature first winter plumage appear first on the chest and belly, and give to this region a peculiarly blotched appearance. Birds of the second brood were in complete juvenal feather, with most of their rectrices full length. It would be interesting indeed to know just when the dropping of the juvenal plumage of the second (or subsequent brood) takes place. Surely this must occur before migration, because the absence of important wing- or tail-feathers would certainly endanger the bird in prolonged flight. It seems possible that some such late birds may not moult until they reach their winter quarters. Examination of local specimens taken in mid October would perhaps show what actually happens.

Many of the late summer and early fall specimens furnish interesting side-lights on the moult. For example, it seems that in the moulting juvenal the feathers of the chest drop out all at once and are replaced by a patch of shining black ones; this patch is rather closely restricted, and does not give breast and belly a speckled appearance. The greater wing coverts and the row of largest lesser coverts (the buff-colored feathers bordering the scarlet shoulder-patches in the adult plumage) drop out all at once and are replaced by a row of pin-feathers, which feather out almost simultaneously. Obviously there is no reason why feathers of such secondary importance as this should not fall out and be replaced all at once; it is remarkable, nevertheless, that such a thing should happen, for it would be just as simple for them to disappear and reappear one by one or two by two, as the rectrices and remiges customarily do. Thus an adult male taken on August 28, 1925, had all its greater coverts completely gone, with no pin-feathers whatever covering the exposed shafts of the primaries and secondaries.

A decidedly yellowish cast particularly on the throat of the juvenal male plumage is noticeable in the moulting specimens. The lesser coverts, greater coverts, and humerals, as well as distal secondaries and proximal primaries, appear about at the same time. A series of females taken September 22 are in almost perfect first winter plumage; the central rectrices, however, are still short in some individuals.

Red-winged Blackbirds linger in the fall until the end of October and early November. Mr. Kirkpatrick's dates of late occurrence for

Meadville are as follows: October 28, 1923; November 2, 1903; December 27, 1896 (flock of twenty-five).

Mr. Kirkpatrick states that the large autumnal flocks sometimes do considerable damage to undeveloped corn in the field.

144. ***Sturnella magna magna*** (Linnæus). MEADOWLARK (501).

A common transient visitant and summer resident, which sometimes occurs in winter. Like the Bobolink it does not nest in the Swamp proper, but in the fields adjoining. It arrives in early March: March 4, 1913, March 12, 1910, Meadville (First); March 12, 1925, Conneaut Lake (Langdon); although the bulk of the nesting birds come later. Mr. Langdon saw individuals as early as March 12 in 1925, but he noted that they were much more numerous two weeks later, and were not present in full numbers until about April 9. We took a male in worn plumage at Atlantic on March 30, 1926.

Nests are built in the latter part of April and early May. We found our first nest at Hartstown on May 11, 1922 (five fresh eggs collected). Another nest with five eggs was found near Hartstown on May 15, 1922. Mr. Kirkpatrick found a nest with five eggs near Meadville on May 21, 1899.

During 1924 and 1925 Meadowlarks were rare at Hartstown, and I saw but two on August 25, 1925. However they were much commoner about Conneaut Marsh, and also at Shermansville, according to Mr. Bergstrom. A large flock was seen on August 27 near Geneva, and on September 3 and 4 near Conneaut Marsh I must have seen two hundred or more in a loose flock. On September 14 Mr. Bergstrom secured an adult male. In this specimen the length of the central tail-feathers was not yet equal to that of the others, and all the rectrices were a little short. Moreover, many of the body feathers were not yet free of their sheaths.

Mr. Kirkpatrick's latest actual record for Meadville is November 7, 1911. He and Mr. Langdon have seen Meadowlarks in winter, however. Mr. Kirkpatrick believes that the Meadowlark was much more numerous forty years ago than it is today.

145. ***Icterus spurius*** (Linnæus). ORCHARD ORIOLE (506).

A very rare and local summer resident, which is also probably a transient visitant, since some individuals pass north along this meridian to nest (*Cf.* Bacon, in Todd, *Birds of Erie and Presque Isle*,

1904, 567). It arrives in May: May 4, 1925, Shermansville (Bergstrom); May 10, 1880, Meadville (Kirkpatrick); and leaves in August, or perhaps early September, our only fall record being for August 22, 1925, Hartstown (Sutton). Mr. Kirkpatrick took breeding specimens near Meadville on July 7 and 27, 1897. One of these is a male in the first nuptial plumage. Mr. Langdon saw a pair on May 20 and 28 and throughout the month of June, 1926, near Conneaut Lake. We saw and heard a male near Espyville, on July 1, 1927. Apparently a nest with eggs has never been found in the region we are discussing. Nesting birds should be looked for in the deciduous trees of the uplands, and not in the Swamp, unless among the willows of the opener portions.

146. *Icterus galbula* (Linnæus). BALTIMORE ORIOLE (507).

Locally a rather common transient visitant and summer resident, arriving in late April and early May: April 24, 1913, and April 27, 1902, Meadville (First and Kirkpatrick); May 1, 1910, Meadville (First); May 3, 1922, Hartstown (Sutton); May 4, 1892, Meadville (Kirkpatrick); May 11, 1925, Cochranon (Langdon). A few days after its arrival it becomes commoner, and nests are started almost at once. An uncompleted nest was found at Hartstown on May 12, 1923. On May 29 this nest held small young; on the same date another nest with young was found. Mr. Kirkpatrick's numerous records show that it is much more abundant at Meadville than at Hartstown or in the vicinity of Pymatuning, although old nests hanging in the sycamores and maples all about Hartstown show that it must have been rather common formerly. Doubtless the abundance of Baltimore Orioles is subject to a good deal of fluctuation. If its favorite nesting trees are removed it disappears at once. Where large elms and sycamores flourish it is usually common.

Mr. Kirkpatrick relates an interesting incident, which shows the bravery of the parent bird in defending its young: "On June 5, 1885, when a nest was found suspended from the drooping branch of a soft maple tree, overhanging the water, I was curious to learn what the nest contained and pulled the branch over far enough for examination; I was surprised to find the female bird in the nest, just as if nothing had happened, nor did she show the least alarm when she was removed and held in my hand for a few minutes before being released. The nest contained four young about two days old."

Our only fall record is August 24, 1925, Hartstown (Sutton). It is so quiet during the late summer and early fall that it is not often noted.

147. *Euphagus carolinus* (Müller). RUSTY BLACKBIRD (509).

A fairly regular transient visitant, sometimes abundant, particularly at Pymatuning Swamp, where it gathers in great flocks among the alders. It arrives sometimes as early as March 14, 1902, Meadville (Kirkpatrick); but usually not until later: March 27, 1926, Linesville (Sutton); March 30, 1894, Meadville (Kirkpatrick); March 29, 1910, Meadville (First); and not in abundance until April: April 6, 1895, Meadville (Kirkpatrick); April 7, 1913, French Creek (First); April 10, 1925, Conneaut Lake (Langdon). On April 27, 1922, we found it present in small numbers at Hartstown. That season was rather late. On April 28 a flock of sixty were seen, and two males shot. On April 29 and 30 and May 1 enormous flocks were seen, the latter passing northward rapidly. From May 6 to 10 but few were seen, and on May 13 a large flock passed; thereafter none was recorded. These flocks stopped in the dense alder thickets north of Hartstown. Their squealing, spluttering jargon was musical at a distance. They fed mostly on the ground, and more than once I was able to approach them closely enough to observe them walking rapidly about, pecking here and there at the roots, and wading through the water up to their bellies, like sandpipers.

We have but few fall records. We saw the first migrants of the season in 1925 on September 22, when a pair was seen in the alders about two miles south of Hartstown. Mr. Bergstrom saw flocks at Shermansville on October 1, 1925, and from October 4 to 26, 1926. Mr. Kirkpatrick has recorded it at Meadville as late as November 14, 1908. In the fall, much more noticeably than in the spring, the Rusty Blackbirds mingle with the Red-winged Blackbirds and the Cowbirds.

148. *Quiscalus quiscula æneus* Ridgway. BRONZED GRACKLE (511b).

A common transient visitant and summer resident rare in the wilder portions of the Swamp; occasional in winter. It arrives early in March: March 8, 1908, Meadville (First); March 10, 1925, Conneaut Lake (Langdon); March 11, 1897, Meadville (Kirkpatrick); March 19, 1926, Shermansville: (Bergstrom). The summer residents are usually all on hand by April 1 and nesting operations begin well before mid

April. Mr. Kirkpatrick found a nest with five fresh eggs on April 25, 1898, near Meadville. Our first sets were found on May 4, 1922, near Espyville. The full sets of eggs were all partly incubated, and one set of five was at the point of hatching. All these nests were placed in the steel structure-work of a bridge crossing a tributary of the Shenango River. As a nesting bird the Bronzed Grackle does not occur at all at Pymatuning Swamp. In fact it is unusual to observe the birds at all in the alders or among the cat-tails. However, on May 15, 1925, I found two nests, each with a full set of eggs, among the cat-tails at the head of Conneaut Lake, in what appeared to me to be a very unusual situation. These nests were less than a foot above the surface of the water.

In the fall the pre-migratory flocks begin to gather in August. Red-wings, Grackles, Starlings, and Cowbirds congregate in favorite fields for feeding, and roost together in hordes in portions of the Swamp, particularly in a copse of dense maples about two miles south of Hartstown. The moult occurs during the flocking period, and specimens, shot on August 21 and September 19 and 27, 1925, near Shaw's Landing, were all moulting. A very handsome male taken on September 23, 1925, at Custards, had an undeveloped tail. Grackles are commonly seen throughout October. Mr. Kirkpatrick saw large flocks near Meadville on November 1, 1903, and Mr. Bergstrom saw it as late as November 20, 1925, near Shermansville. We saw one bird near Hartstown eating frozen apples in the snow on February 18, 1925, and Mr. Bergstrom recorded one in the town of Conneaut Lake on January 14, 1926. A small flock had been seen about the town for three weeks prior to this date. These are probably to be regarded as winter records.

149. *Hesperiphona vespertina vespertina* (W. Cooper).

EVENING GROSBEAK (514).

This erratic wanderer doubtless occurs in large numbers when it moves eastward or southward of its usual range. Warren speaks of its occurring in Crawford County during the late winter of 1889-90 (*Birds of Pennsylvania*, 1890, 225) and the several Meadville records of Mr. Kirkpatrick during March, 1890, tend to verify the statement. Mr. Kirkpatrick took two specimens from a flock of three seen in the top of a tree near French Creek about one mile south of Meadville, on March 25 of that year. Mr. Sennett took a specimen at Meadville

on July 21, 1910. This date is very unusual, since the species customarily occurs only during the winter months. Mr. Bergstrom secured a single female specimen about three miles north of Hartstown on March 8, 1926. This individual was feeding on sumac. However, its stomach held seeds of a number of different plants. Its condition was only fairly good, and about half the rectrices were missing. This is apparently the only Evening Grosbeak which has visited the Swamp in recent years.

150. *Pinicola enucleator leucura* (Müller). PINE GROSBEEK (515).

Like the last species a rare and irregular visitant, usually occurring in winter. Mr. Edgar Huidekoper furnishes our only records. He took two adult birds, a male and female, from a small flock, which were feeding in syringa bushes in his yard at Meadville, during February of a former year, probably as early as 1885. The exact date was never recorded, but both specimens were carefully preserved, and are at present in his collection at Meadville. Mr. Huidekoper saw them during two subsequent winter seasons, but did not record the dates.

151. *Carpodacus purpureus purpureus* (Gmelin).
PURPLE FINCH (517).

Occurs throughout the year, but is commonest as a transient visitant. During winter its occurrence is irregular. It nests in small numbers in the Swamp, as well as elsewhere in the region.

It was recorded by us on February 11, 1927 (male taken), and on February 19, 1925 (two birds), near Hartstown; and by Mr. Kirkpatrick on February 27 (about twenty-five birds seen in one flock) at Meadville. These were probably winter records. It was seen in some numbers on April 10, 1896, and April 19, 1914, at Meadville by Messrs. Kirkpatrick and First, respectively, so that migration probably does not begin until late March and early April.

On May 1, 1922, a pair (probably mated) were observed north of Hartstown picking at the tamarack buds. A male in full plumage, shot May 5, 1925, had much enlarged testes, and was either nesting or preparing to do so shortly. A female secured on May 6, 1926, by Mr. Langdon, had much enlarged ovaries. Although brilliantly singing birds were constantly observed until May 18, 1922, they seemed to disappear after that date. On May 16, 1925, a pair was found

building a nest in a high, thinly leaved tamarack two miles below Linesville. The male sang ecstatically for minutes at a time and the female came with great mouthfuls of twigs and soft materials with which she worked energetically while weaving them into the nest. Mr. Langdon observed two pairs near Conneaut Lake during June and July, 1926. Mr. Kirkpatrick found a nest with fully fledged young near Meadville on July 20, 1895. Mr. Todd secured a single male specimen, which was singing near Hartstown on June 16, 1897, and Warren states that the birds have been known to nest in Crawford County (*Birds of Pennsylvania*, 1890, 227). Mr. Crumb has a single egg which was taken in a former year from a nest, which he found in a tree in an orchard about four miles west of Linesville.

The post-nuptial moult of the local summer residents is apparently not complete until about the last of September. A male without tail was seen September 4, 1925, near Shaw's Landing. A male taken September 19, 1925, two miles south of Hartstown, had dropped all but the two outer old rectrices, and was otherwise in new plumage. I believe, therefore, that the actual migration of these birds does not take place until considerably later, and that the immature birds seen all during late August and early September of 1925 were locally hatched. Probably Mr. Kirkpatrick's record for Meadville, October 17, 1908, represents actual migration. Mr. Bergstrom has known them to be very abundant in November near Shermansville.

152. *Loxia curvirostra pusilla* Gloger.

RED CROSSBILL (521).

A rare and very irregular winter visitant, which, so far as can be determined, has been recorded at the Swamp only during the late winter season of 1922-23, at which time great flocks of this and the succeeding species were seen everywhere among the hemlocks and other conifers, even as far south as Allegheny County (See Christy, Crossbill Visitors, *Bulletin of Audubon Society of Western Pennsylvania*, 1923, 10). Mr. Hunter saw at least a thousand on one day near Hartstown, so he told me. One male bird was brought in by a cat.

The Red Crossbill, according to all records at hand, is not so common as a winter visitant in Pennsylvania as the White-winged species, although if either ever nests it is without question the former.

153. *Loxia leucoptera* Gmelin. WHITE-WINGED CROSSBILL (522).

A rare and irregular winter visitant from the far north, recorded, so far as our records show, only during the late winter season of 1922-23, at which time a remarkable southern invasion of Crossbills occurred from about January 20 to March 18, according to Mr. Hunter and others. The White-winged Crossbills were much more abundant than the preceding species. This species doubtless occurred at the Swamp also in the winter of 1874-75, when, according to Sennett, a southern movement took place (Todd, *Birds of Erie and Presque Isle*, 1904, 569).

154. *Acanthis linaria linaria* (Linnæus). REDPOLL (528).

Mr. Todd regards this species as possibly regularly occurring at Erie during winter (*Birds of Erie and Presque Isle*, 1904, 569), but our winter records are comparatively so incomplete that there must be some question as to its status in Pymatuning. It is almost certainly an irregular visitant so far south as this. Mr. Kirkpatrick took a male during the late fall of 1889, near Meadville, but the exact date has been lost. This specimen was preserved and has been carefully compared by Mr. Todd with the large series of Redpoll skins at the Carnegie Museum, Pittsburgh.

155. *Astragalinus tristis tristis* (Linnæus). GOLDFINCH (529).

An abundant permanent resident, most noticeable during the spring just after the prenuptial moult, at which time great hosts of the birds assemble in noisy flocks, singing in such numbers as to lend an almost unbelievable volume, and strangely tuneless effect to the music. They nest late, laying their eggs in the latter part of June and in July. While five nests have been found in the Swamp, most of the Goldfinches obviously prefer to rear their young about the towns, where they inhabit the maples and other shade-trees along the streets. On August 21, 1925, I found a nest with four heavily incubated eggs about three feet from the ground in a small viburnum bush about a mile north of Hartstown. On September 1 these eggs all hatched. On September 5 the young were well covered with pin-feathers. On September 11 the birds were perched on the rim of the nest, and all jumped off when I approached, although they could not fly well. During the following two days their powers of flight greatly increased

and I could not capture them. Mr. Kirkpatrick found nests with eggs near Meadville on August 8, 1893 (one egg), and August 10, 1902 (four eggs). The latter nest was first found on August 3, when the eggs had not yet been deposited. It was built in the upright crotch of an alder bush about five and one-half feet from the ground. The nest was "a beautiful structure three and one-half inches in diameter at the top and three inches long on the outside, composed of thin strips of weed fiber, grape-vine bark, and fine grasses, and lined with thistle-down. The interior was two and one-quarter inches in diameter and one and one-half inches in depth."

156. *Spinus pinus pinus* (Wilson). PINE SISKIN (533).

The status of the Pine Siskin at Pymatuning was a mystery to me until the summer of 1925. It had been recorded frequently in early spring, and particularly on May 16 and 17, 1923, at which time four specimens were secured by Mr. Todd and myself from the large, noisy flocks, which fairly swarmed in the tamaracks below Linesville. Like the Crossbills, it doubtless also occurs in varying numbers throughout the winter months, but it was the chance finding of fully fledged young leaving the nest, in Potter County (May 19, 1925) which led me to believe that the Pine Siskin is a summer resident, or, more accurately, a spring resident in this region.

From February 18 to 21, 1925, Siskins were abundant everywhere in the hemlocks north of Hartstown and were roving about in noisy pairs, though strangely enough, I was at the time blind to the fact that they were mated. Over and over again I watched the busy birds stripping the fiber from the stalks of weeds and gathering woolly stuff from old buds and cocoons, and in my ignorance diagnosed their actions as a quest for food. All this time they were probably building nests. These nests would likely have been completed during the next two weeks, and eggs laid during the middle of March. Therefore the great flocks of birds seen on May 16 and 17, 1923, were probably young birds, which had been reared at the Swamp, together with their parents. I have at hand numerous old nests of the Siskin (taken from horizontal hemlock boughs, and which I had temporarily identified as those of the Goldfinch) which agree admirably with the nest from Potter County from which the young birds had flown. This extremely early nesting is not mentioned by Warren (*Birds of Pennsylvania*, 1890, 231) and is not suggested by dates given by Chapman

(*Birds of Eastern North America*, 1914, 383); but it is entirely confirmed by the records of Mr. Ralph B. Simpson, of Warren (only a comparatively short distance east) who has found that eggs are laid from mid March until about the last of April. He found young birds in the nest on April 1 and 6, 1925; April 28, 1912; and May 2 and 3, 1912. Although the actual nest with eggs or young is yet to be found in Pymatuning, there is no doubt in my mind that this bird, the habits of which are really so little known, is a regular nesting species in this locality.

In the fall migrants appear rather early: September 17, 1925, Hartstown (Sutton) and become abundant by the end of the month. They are irregularly noted throughout the winter. It is a question where they spend the months of June, July, and August, unless they simply wander about at this season.

***Passer domesticus* (Linnæus). ENGLISH SPARROW**

While these undesirable creatures swarm about the towns and farms all through the region, they are practically never seen in the Swamp or woodlands. A nest with five fresh eggs was collected at Hartstown on May 4, 1922. They doubtless nest much earlier than this. Mr. Kirkpatrick has found nests with eggs on the following dates at Meadville: April 28, 1898; May 5, 1898; June 22, 1897.

English Sparrows are not to be considered as an enemy of the bird-life of the Swamp. But certain species of the surrounding territory have been sadly victimized. Apparently, the species most violently preyed upon has been the Cliff Swallow, which in former years fairly swarmed about the farm-yards. Today but a few colonies remain. The English Sparrow drives the birds out and lines the nests anew for their own use.

Whatever may be said against the English Sparrow, however, let this one commendatory remark be made: Young English Sparrows are fed upon the most varied diet of insects and like forms which includes many hard-shelled, or ill-smelling species, which are shunned by most of the common small birds, which usually prefer the dainty, soft forms, such as measuring worms, small moths, etc.

157. *Plectrophenax nivalis nivalis* (Linnæus).

SNOW BUNTING; SNOWFLAKE (534).

Snowflakes were found to be common and regular as winter visitants, even so close at hand as Erie by Mr. Todd (*Birds of Erie and Presque Isle*, 1904, 570). Warren (*Birds of Pennsylvania*, 1890, 232) states that Sennett and others regarded it as a regular winter visitant in Crawford County. While it is at times doubtless locally abundant, it is certainly not regularly found in the area under discussion.

Snowflakes have occurred at only two points near the Swamp, ac-

ording to Mr. Bergstrom: in the wide open fields to the north and west of the Swamp; and in the grassy prairie to the north of the corduroy-road west of Shermansville, where they were observed in January and February of 1924, on February 13, 14, and 17, 1925, and several times in January and February, 1926. Mr. Bergstrom saw large flocks at Harmonsburg (north of Conneaut Lake) and at Woodcock (north of Meadville) during early February, 1925. Mr. Langdon saw a flock on October 31, 1926, north of Conneaut Lake.

Flocks of a thousand or fifteen hundred individuals were seen in Erie, Crawford, and Mercer Counties, during January and February, 1926. Such flocks as these Messrs. Langdon and Bergstrom saw near Titusville on January 20, and between Shermansville and Conneaut Lake, on February 27. Mr. Bergstrom thinks there were no Lapland Longspurs with the flock, and Mr. Ralph B. Simpson states that the small flocks observed in Warren County were composed entirely of Snow Buntings. Mr. Edmund Arthur of Pittsburgh saw Snowflakes during February, 1926, in Mercer County not far from Pymatuning Swamp (*Cardinal*, No. 8, July, 1926, 9). Mr. Kirkpatrick took five specimens near Meadville on January 7, 1895, on which date they were abundant. He recorded also a large flock on January 21, 1891, about two miles west of Meadville.

***Calcarius lapponicus lapponicus* (Linnæus). LAPLAND LONGSPUR (536).**

Found irregularly during fall, winter, and early spring at Erie (Todd, *Birds of Erie and Presque Isle*, 1904, 570-571). From Pymatuning we have no record, though it seems highly probable that occasional Longspurs occur with the visiting Snowflakes, as they do elsewhere. Once or twice Mr. Bergstrom and others have noted birds resembling English Sparrows among the flocks of Snowflakes. These were likely Longspurs of some kind, but unfortunately no specimens were taken.

158. *Poœetes gramineus gramineus* (Gmelin).

VESPER SPARROW (540).

An abundant transient visitant and summer resident, found in the open fields and farmlands and never in the woods or swampy country.

It arrives in late March and early April: March 29 and 30, 1926, Linesville (Sutton); April 4, 1925, Conneaut Lake (Langdon); April 14, 1909, Meadville (Kirkpatrick); April 16, 1925, Shermansville (Bergstrom). On April 27, 1922, it was abundant and males were singing loudly everywhere in the upland pastures. Although nests undoubtedly held eggs at the time, none was found until May 13.

The eggs found on this date (four) were about half-incubated. Nests, each with four eggs, were found on May 15, 16, 21, and 22, 1922. The last of these sets was almost ready to hatch. On May 29 another nest with heavily incubated eggs was found. In 1923 a nest with two fresh eggs was found on May 16. Mr. Kirkpatrick found nests near Meadville on June 26, 1897, and July 18, 1897 (young).

Young, just able to fly, and a nest, with five young about to leave, were found near Hartstown on June 1, 1922; and a young one, well able to fly, was captured on May 28. Thus it appears that the first brood of young is usually on the wing by the first of June, and that by that time nests for the second brood of young are being built. All nests were sunk well below the surface of the ground, and only one of them was much sheltered by vegetation. In collecting the nests some difficulty was experienced, since the lining was thin and the structures did not easily hold together.

In the fall the pre-migratory flocks gather early in September. We took an immature male in fresh plumage at Hartstown on August 25, 1925. Mr. Bergstrom noted several on October 2, 10, and 16, 1925, and, while this happens to be our latest fall date, the birds likely do not entirely disappear for several weeks.

159. *Passerculus sandwichensis savanna* (Wilson).

SAVANNAH SPARROW (542a).

A fairly common and regular transient visitant and summer resident, arriving in late March and early April, and remaining until the middle of autumn. It is noticeably restricted to the open, upper fields, where the grass is short, and where there are no trees, and to the wide meadows in the lower country, particularly at the head of Conneaut Lake.

On March 30, 1926, west of Linesville I collected a male, which was not in perfect plumage. On the following day four birds were seen, and another male in imperfect feather was taken. Mr. Kirkpatrick recorded it first at Meadville on April 12, 1909. On April 27, 1922, we saw a male bird singing in the fields northwest of Hartstown. On May 4, three pairs were seen near Espyville, and on May 7 so many were observed (all apparently mated) that nesting had probably commenced. During 1922 they were often watched, particularly those pairs which were nesting in the high fields above the meadows, where the Henslow's Sparrows lived.

Warren (*Birds of Pennsylvania*, 1890, 234) states that Sennett found the bird nesting in Crawford County.

On May 29, 1922, a nest was found in which were two young and two eggs at the point of hatching. These eggs were delicate pale blue, blotched with gray and brown. The very thinly lined nest had no shelter whatever, and was built in a pasture where several cows and sheep grazed.

On May 30, 1924, a nest and five young were found in a field just west of Hartstown. On May 31, 1924, Miss Helen Blair found a beautifully situated nest, containing five eggs just on the point of hatching. These eggs were very handsome, having a pale blue-green ground-color, blotched with deep brown. On the following day there were five young in the nest. The parents were excited at our presence, but gave forth only a weak "chuck" as a note of remonstrance. When observed from a distance they flew or walked directly to the nest, which was shaded by a group of small clover leaves and a clump of sheep-sorrel.

From May 14 to 17, 1925, we found it more abundant than ever before, nesting pairs being observed in nearly every field where either Grasshopper or Vesper Sparrows occurred. Mr. Kirkpatrick found a nest with young near Meadville on June 20, 1897.

During 1925 there must have been many nesting pairs in the vicinity of Hartstown, for flocks of from ten to thirty immature birds were seen daily from August 22 onward. These immature birds were in handsome, fresh plumage, and were seen along the borders of the Swamp; while the adults, which were not yet in fresh feather, remained apart from the young in the upper fields, where they had nested. Immature specimens were taken on August 24 and September 4. Savannah Sparrows were very numerous in the sedgy area of Conneaut Marsh on September 4 and 7. Due to the known occurrence of local nesting birds it is difficult to state just when the actual migration started, or when the birds from farther north arrived. However, they were common as late as October 1, 1925, in all the region observed.

160. *Ammodramus savannarum australis* Maynard.

GRASSHOPPER SPARROW (546).

A common summer resident from late April and early May to early fall, most noticeable in the spring during its song season. It is fond

of the wide, hot, dusty fields, where its monotonous song, sandy coloration, and buzzing flight are reminiscent of western plains and waterless places.

On April 29, 1922, our earliest date of arrival, two males were heard singing near Hartstown. On May 7 the full population was present; the birds were busy mating, the males fighting. On May 25 two nests, respectively with sets of four and five eggs, were found near Hartstown. The female flushed so closely from one of these that the five eggs were crushed under foot. This set was somewhat incubated. On June 1, 1922, Mr. Lewis Richardson found two nests near Hartstown, each with five eggs, one set of which was about to hatch. On May 31, 1924, a nest with four young was found. Mr. Kirkpatrick found a nest on June 20, 1897. It was built on the ground in a high, dry meadow, east of Meadville, and contained four fresh eggs.

The birds often sang very late in the evening, sometimes after sundown, when it was so dark that it was quite impossible to see the singers. They never, so far as I know, sang at night, as do the Yellow-breasted Chat, Black-billed Cuckoo, and Wood Pewee.

In the fall the Grasshopper Sparrow is so quiet and obscure that it is almost impossible to find it. However, after much searching we recorded individuals near Hartstown on August 30 and September 15, 16, and 20, 1925. I believe the moult was complete at this time, though no specimens were secured.

The stomach of a male secured on June 16, 1923, held numerous cricket-nymphs.

161. *Nemospiza henslowii susurrans* (Brewster).

HENSLOW'S SPARROW (547).

This small and seclusive sparrow must be regarded as among the most local in its distribution of the summer residents, for, although careful search revealed numerous spots seemingly admirably suited to its needs, the fact remains that in the whole of the region they were found in only one comparatively small field, and there only during the spring of 1922. So attached were the birds to this nesting-ground that not once was one known even to fly across the road to the adjoining field, which apparently was exactly like the one in which they nested.

They were found about a quarter of a mile west of Hartstown in an

upland meadow, which was not a part of the Swamp. Here, in a wide expanse of deep, though scarcely rank, and certainly not sedgy grass, traversed by a small overgrown stream, and bounded at a distance by a road and fields under cultivation, the Henslow's Sparrows were nesting. There were easily a dozen pairs in this meadow, the area of which was not over ten acres. In the same field there were also Grasshopper Sparrows, Meadowlarks, and Bobolinks, the latter particularly abundant. Wild mustard grew profusely in patches all over the area. This weed became increasingly noticeable as the season progressed.

They were first noted on the evening of May 11, 1922. While we had several times previously walked through the meadow, where they occurred, without seeing the birds, I do not regard May 11 as the date of their first appearance. There are so many chances of missing such a retiring species when it first comes, that the earliest dates are necessarily open to question. On May 11 the full population seemed to be on hand. The male birds were singing all over the field, in the subdued, mellow light of evening. Quaintly unmusical and abbreviated was the performance. They were extremely tame and often allowed us to approach to within ten feet, as they crouched mouselike in the clusters of mustard flowers. Then after summoning sufficient courage they stood erect with tail down, threw back their heads, and with their large, pale-colored bills wide open, gave forth the slight syllables "Chis-lick", as though they were producing fine music.

When they were closely approached, they seemed nervous, but instead of jerking their tails, or elevating the crest feathers, as so many species do in expressing excitement, they lowered their heads, leaned toward the ground, and *jerked all over*, a movement seemingly governed by the action of the knees and tarsi. They acted as though they wished to forsake their perches, but could not determine whether to drop to the grass, or to fly away. In this respect they were noticeably different from the Grasshopper Sparrows, which always flew away whenever they were even remotely approached. Often the Henslow's Sparrows, upon being too closely pressed, would drop twelve or eighteen inches to the ground, without spreading their wings to break the fall, and scuttle away through the grass.

The flight of the two species under consideration is quite dissimilar. That of the Henslow's Sparrow is more erratic and undulating, and the tail and rump twist or twirl in a peculiar and very characteristic

way, just a second or two after the bird has flushed or left its perch. This twisting motion seems to be accompanied by a temporary change in the beat of the wings, and gives the impression that the propellant power ceases for an instant, while the bird rearranges its body. The reddish brown color of the tail and back is a good field mark as the bird flies away, and of course the large bill, the greenish cast of the neck, and the ludicrously short tail are all noticeable. The Grasshopper Sparrow always seems very dusty in comparison.

The alarm note of the two species, while admittedly similar, is stronger in the case of the Grasshopper Sparrow, and sometimes two-syllabled; the call-note of Henslow's Sparrow is weak, and at a distance scarcely to be heard at all.

During the three weeks of observation we tried to locate a nest and spent many hours of several days studying the birds. Females were flushed near at hand several times. On May 18, a bird (probably a female) was seen with a dry grass in her bill, but she dropped it, and having herself disappeared in the grass, could not be found again. They were often noted in the bushes along the little stream, where, however, they rarely sang. On May 19 a male bird was shot, and, as was expected, the testes were found to be much enlarged. On May 30 a female specimen was secured with the belly bare of feathers. On June 1, after watching a pair of birds for over two hours, a nest was finally located, containing five young which had just hatched. The parents in approaching the nest sneaked through the grass for several yards. The nest was built under a clump of grass, and the entrance between the blades of grass was so small that even from directly above the nest it was almost impossible to see it. The young were fed small grasshoppers and other insects. Continued search failed to reveal any other nests.

While Dr. Chapman (*Birds of Eastern North America*, 1914, 390) quotes Mr. P. L. Jouy's description of a rather elaborate song attributed to this species and resembling the syllables "sis-r-r-rit-srit-srit", I never once heard the birds utter this song, though I observed them for hours at a time at all hours of the day; but I did often hear the Grasshopper Sparrow give such a song, the spirit and tonal quality of which are very well represented by the above syllables. I had unusual opportunity to compare these two species, since both were nesting in the same field, although the Grasshopper Sparrow seemed to prefer the shorter grass of the higher portions.

Although the Henslow's Sparrows sang intermittently all day, their particular song-periods occurred just at sunrise, and in the evening. There was something delightfully picturesque about the birds, when just after sundown they mounted the mustard stalks, and outlined against the golden flowers, gave forth their queer, monotonous notes.

In the spring of 1923 the field where we had found them the year before was plowed and planted, and the birds could not be found anywhere. Although we have searched the likely meadows diligently on every subsequent visit to the region, the species has not been recorded since 1922.

162. *Zonotrichia leucophrys* (J. R. Forster).

WHITE-CROWNED SPARROW (554).

A rather common transient visitant, which arrives later in the spring than the White-throated Sparrow, and usually remains later than that species in the fall. Mr. Kirkpatrick has twice recorded it at Meadville in April: April 23, 1908; April 30, 1906. He, however, usually looks for it in early May: May 3, 1913; May 6, 1901. Although the species was carefully sought during the spring of 1922 no birds were seen until May 4, on which date a flock of six were observed. Thereafter, it was seen daily, and a specimen was secured on the date of their last appearance, May 20. On May 15 and 16, 1923, and from May 15 to 17, 1925, the birds were quite abundant near Hartstown and Shermansville, and were singing everywhere. A male specimen secured on May 20, 1922, was exceedingly fat.

In the fall it appears in late September: September 24, 1925, Hartstown (Sutton); and remains about three weeks. Mr. First recorded it at Meadville on October 8, 1913, and Mr. Kirkpatrick saw one as late as October 25, 1908.

163. *Zonotrichia albicollis* (Gmelin).

WHITE-THROATED SPARROW (558).

An abundant migrant in spring and fall, the immature birds often appearing in great numbers in the early fall. Mr. First has recorded it at Meadville several times in April: April 14, 1908; April 15, 1909; April 21, 1910; April 25, 1914. An individual seen April 28, 1922, marks their arrival for that season, since only one bird was seen, although thereafter they became abundant. They remained about

in large numbers until May 18. Thereafter but few were recorded, although one was seen at Crystal Lake by Messrs. H. H. Elliott and Jesse Jones on May 28, and I saw one bird on May 29. White-throated Sparrows were always particularly abundant about the lakes near Hartstown, both in spring and fall.

In the fall of 1925 it was first seen on September 22, when two were detected at Pymatuning; on September 23 it was very abundant all about Crystal Lake; and was seen thereabouts until October 16. Mr. First's latest fall record for Meadville is October 26, 1913.

164. *Spizella arborea arborea* (Wilson). TREE SPARROW (560).

Abundant as an early spring and late fall migrant and fairly but irregularly common as a winter resident, coming southward from the north in October and leaving by late April.

On April 27, 1922, during a chilly and late spring season, a few of the birds were still wandering in restless groups about the edge of the Swamp. On April 28 a flock of ten were watched for some time. On April 29 only three birds were seen, and thereafter no birds were recorded. On February 11, 1927 a few small flocks were recorded. From February 18 to 21, 1925, the species was recorded, but it was not common. By March 10, however, so Mr. Langdon says, the birds were exceedingly numerous, flocks of hundreds or even thousands being seen everywhere.

Mr. First has noted it near Meadville as early as October 31, 1913. Mr. Kirkpatrick's first date of fall appearance is November 12, 1897. On December 22 and 28, 1908, it was abundant at Meadville (Kirkpatrick).

165. *Spizella passerina passerina* (Bechstein).
CHIPPING SPARROW (560).

A common summer resident in the cultivated districts from the second week in April until late September, and practically never recorded away from human habitations, save in the fall just before the birds leave for the south, at which time flocks may occur anywhere. Mr. Kirkpatrick's earliest spring date is April 6, 1902. Usually they do not arrive until a little later: April 18, 1899; April 22, 1908; April 23, 1903, Meadville (Kirkpatrick); April 28, 1925, Conneaut Lake (Langdon).

On April 27, 1922, at Hartstown the birds were numerous and sing-

ing. Nests were found during 1922 as follows: May 5, three eggs, in hemlock; May 7, four eggs, in small rose-bush; May 11, three eggs, in barberry; May 19, three eggs, in pine, about a quarter of a mile from a farm-house; May 20, two much incubated eggs and one egg of a Cowbird, in a spruce tree at Hartstown.

In the fall the families remain together until late August. We observed such families near H^{er}tstown on August 25, 1925. Large flocks are found later: September 14, 15, and 18, 1925, Hartstown (Sutton). Mr. Bergstrom saw it on October 16, 1925, but it doubtless remains until later, since it was seen by Mr. Sennett at Erie on October 27, 1888 (Todd, *Birds of Erie and Presque Isle*, 1904, 578).

166. **Spizella pusilla pusilla** (Wilson). FIELD SPARROW (563).

An abundant summer resident from April to October, found principally in the bushy fields and on the open hillsides, and never in the Swamp proper.

It arrives sometimes in late March: March 26, 1908, Meadville (First); but not usually until April: April 3, 1907; April 10, 1909; April 11, 1911, Meadville (First); April 8, 1909, Meadville (Kirkpatrick). We caught a crippled individual on April 27, 1922. On April 28 several were seen about Hartstown. Numerous nests (twelve during 1922 and two during 1923) were found, most of which were placed on the ground sheltered by weeds, or in a low thick-growing bush. One was placed in a black raspberry bush in a rather exposed situation. A beautiful nest found May 16, 1925, was placed deep in a clump of the feathery leaves of Queen Anne's lace. The first nest with a complete set of eggs was found on May 12, 1922. Nests held young from May 23 on, and one brood of young were at large by June 1. The sets of eggs were usually four, although several sets of three were found, and Cowbird eggs three times accompanied the sets. Mr. Kirkpatrick found nests with young on June 27, 1914, and July 25, 1897, near Meadville.

A nest found June 1, 1924, ready for eggs may represent an early date for a second brood, unless the first set or young had been destroyed. On August 20, 1925, a nest containing young was found near Hartstown. This was certainly a second brood for the season.

In the fall migration period it is not numerous; the migrant visitors seemed to appear about September 22, during the fall of 1925 and they were common until the end of October.

167. *Junco hyemalis hyemalis* (Linnæus).

SLATE-COLORED JUNCO (567).

An abundant transient visitant and irregularly common winter resident, which arrives from the north in October: October 4, 1913 and 1914, Meadville (First); October 6, 1925, Shermansville (Bergstrom); October 22, 1908, Meadville (Kirkpatrick). It remains until the latter part of April and early May, at which time all but the few nesting pairs leave for the north. Winter resident Juncos have thus been seen as late as March 11, 1925, Conneaut Lake (a large flock) (Langdon); and April 11 and 29, 1922, Meadville (Kirkpatrick). Individuals seen later than this are likely to be summer residents, particularly if they are mated or not in flocks.

In 1922 from April 27 to 30 small flocks were seen. By May 2 all had departed, save two mated pairs, which remained in the hemlock clumps west of Linesville. One of the females was already building a nest on this date in a low bank between two small hemlocks. When this nest was visited on June 1 (we were unable to examine it during the intervening weeks) the four young had left, but were seen with their parents nearby. Mr. Kirkpatrick found a pair feeding their young just out of the nest, at Hoag's Ravine near Meadville on June 10, 1907. He has not found it common or regular as a summer resident, although a pair was recorded by him on July 17, 1897, in Buchanan's Ravine south of Meadville. During 1925 close search failed to reveal any nesting pairs, although from February 19 to 21 wintering flocks were seen several times. According to Messrs. Langdon and Bergstrom the flocks seen on March 11, and April 15 were much larger than those we encountered in February. Mr. Crumb has in his collection a single egg taken from a set of five which he found in May of a former year about three miles west of Linesville.

They were observed to be fond of roosting in the dead fallen boughs of beech trees, where they chirped and scuttled about, rattling the leaves as they sought a comfortable perch.

168. *Melospiza melodia melodia* (Wilson).

SONG SPARROW (581).

One of the most abundant and widely distributed birds of the region, remaining throughout the year, but noticeably commoner as

a migrant and summer resident than as a winter resident. Mr. Kirkpatrick gives its status for the Meadville region as follows: "very common in the rural districts from April to November; a very limited number winter regularly, but whether any individuals remain throughout the year is not known". Whatever the migratory movements of this species may be, it is certain that by the middle of April the nesting birds are all on hand, singing and mating. During 1922 we found twenty-six nests, which were located in all parts of the Swamp and in the surrounding country. While the majority of them were on the ground, some were built in the cat-tails; one was beautifully situated twenty inches from the ground in a clump of *Equisetum*; one was hidden in a low hemlock tree; and one was placed at least six feet up in a thick bush. A nest with highly incubated eggs was found on April 28, 1922. I feel certain that this was the nest of birds that spent the winter at Pymatuning, because all nests subsequently found held incomplete sets, or full sets of fresh eggs, and the first young birds were found on May 16.

Sets of five eggs were commonest, although three, four, and six eggs were also found. One Cowbird egg accompanied the sets in four nests. A nest found June 1, 1922, with three fresh eggs, as well as one found June 1, 1924, with five fresh eggs, probably represent second broods of the season.

During the late winter of 1924-25 only a few birds were present at the Swamp, and most of them were silent. One, however, sang a strangely confused and almost unrecognizable song, not at all characteristic of the species.

169. *Melospiza lincolnii lincolnii* (Audubon).

LINCOLN'S SPARROW (583).

While this sparrow is doubtless a regular spring and fall transient, it is so retiring in habits and usually so silent that it nearly always escapes detection. On May 15, 1925, three were seen near Shermansville, along the weedy edge of an upland field bordering the Swamp. One of these, a male, was secured to authenticate the record. It was so mutilated by the heavy charge of shot that it could not be saved as a specimen, but diagnostic portions were preserved. On May 24 Miss Helen Blair observed a bird near Crystal Lake, which sang a number of times, and which she feels certain was of this species. Since she is familiar with both the Song and Swamp Sparrow which

normally occur there, I am inclined to give credence to the record. The song resembled that of the Song Sparrow, but the bird lacked the bold streaking, had the characteristically buffy breast, and was quiet in manner. If this was indeed an individual of this species the date probably marks about the last of the spring migration.

At present we have no fall records.

170. *Melospiza georgiana* (Latham). SWAMP SPARROW (584).
(Pl. X, fig. 2).

Abundant and characteristic of the entire marshy and swampy area of the region, never occurring in the woods, but often found nesting in weedy growths along the woodlands or about the small ponds anywhere throughout the Pymatuning region. While the Swamp Sparrow is principally a summer resident from the middle of April until October, numbers of the birds also pass through as migrants, and occasionally an individual may winter. Mr. Kirkpatrick's following records seem to indicate casual winter occurrence: December 22, 1908; January 9, 1909; March 14, 1908 (Meadville). An individual seen by us near Hartstown on February 19, 1925, may have been a cripple, but it seemed to be in perfect health and vigor.

The Swamp Sparrow usually arrives in late March or early April: March 23, 1907, and April 7, 1914, Meadville (First); April 10, 1925, Conneaut Lake (Langdon); and becomes commoner by mid April. Nests just ready for eggs were found on May 3 and 4, 1922, characteristically situated between or on last year's cat-tail stalks. On May 11 two sets of four fresh eggs were found. From then on no less than sixty-six nests were located (including those found in 1923, 1924, and 1925) and enough data were gathered to make possible some definite statements concerning the nesting habits of the species.

Nests were found to be, on the average, completed and ready for eggs by May 7. The eggs, laid daily, usually numbered four or five, but were sometimes three, and never, so far as we found, six. Nests were almost never placed on the ground, but were built between the cat-tail stalks, or upon the bent-down clumps of stalks and leaves, and were often completely hidden from above by the broad, dead leaf-blades. Entrances to the nests were almost always from the side, and rarely from above. The material of the lining varied but little. It was always of fine grasses, and not varied with plant-fiber, roots, or hair, as might have been expected. The material forming the founda-

tions of the nests was often coarse and bulky, and some of the structures were huge, sprawling affairs. Nests were often built directly above the water, where the depth varied from six to twenty-four inches, and were usually built about a foot or more above the surface. Nests with small young were found on June 1 and 3, 1922, and from June 4, 1923, onward.

The eggs, which vary from pale apple-green to clear pale blue in color, were usually handsomely blotched with deep brown. Occasionally, however, the eggs much resembled those of the Song Sparrow, being evenly sprinkled with gray and dull brown spots, and lacking the blue ground-color which usually distinguishes the eggs of the present species.

Female birds, which did not flush close at hand thus at once disclosing the location of their nests, slipped off at a distance of twenty feet or more and either skulked away like mice or fluttered off among the cat-tails. Nests were most often found in the open cat-tail stretches; but frequently they were built far back in the recesses of the wooded swamp in the little open spaces, where cat-tails and alders still maintained a foothold.

An immature male shot on September 16, 1925, at Conneaut Lake was in full winter plumage. I believe that the heavy wave of the fall migration is from September 15 to about October 10. Swamp Sparrows occur much later than this, of course, but not in large numbers.

171. *Passerella iliaca iliaca* (Merrem). FOX SPARROW (585).

A common migrant in early spring and middle and late fall, occurring chiefly in the woodlands of the higher regions. Mr. Bergstrom found it common near Shermansville on March 8, 1925. Mr. First's Meadville records are as follows: March 22, 1909; March 24, 1923; March 29, 1914. Mr. Kirkpatrick's Meadville records are: March 30, 1909; April 4, 1904. In 1922 but few birds were seen by us and the only dates recorded were April 27 and 28. Likely the height of the spring migration had passed before that time.

Mr. First's earliest fall record for Meadville is October 13, 1913. Mr. Kirkpatrick has noted it as late as November 7, 1908, in the vicinity of French Creek.

172. **Pipilo erythrophthalmus erythrophthalmus** (Linnæus).
TOWHEE (587).

A common summer resident in the entire region; rare as a migrant, since this latitude marks about the northern limit of its range. It arrives in late March and early April: March 27, 1907, March 28, 1908, and March 31, 1911, Meadville (First); April 4, 1925, Shermansville (Bergstrom); April 11, Conneaut Lake (Langdon). It remains until November and occasionally winters. Mr. First recorded a pair at Meadville on December 21, 1913; Mr. Merl Hutchens saw one near Hartstown throughout January, 1923; Mr. Langdon noted a female at Conneaut Lake on January 2, 3, 10, 18, and 28, 1927.

A nest with three eggs was found on May 3, 1922, and many mated pairs, which doubtless had nests, were observed near Hartstown. A nest and four fresh eggs, found May 16, 1922, was subsequently destroyed by a Crow, which ate the eggs and pulled the nest to pieces. On May 20 and 25 nests with three Towhee and one Cowbird egg in each were found. On June 17, 1923, a nest and four eggs were collected (probably a second set) near Shermansville. Mr. Kirkpatrick found nests at Meadville on the following dates: May 24, 1892; June 20, 1915; June 24, 1915 (small young); and July 21, 1898 (well developed young). Young birds just out of the nest were observed near Dollar Lake on June 15, 1923.

173. **Richmondia cardinalis cardinalis** (Linnæus). CARDINAL (593).

A fairly common permanent resident, more noticeable in winter than at other seasons. Warren regarded it as a resident in only the southern part of Pennsylvania (*Birds of Pennsylvania*, 1890, 245) and Mr. Todd cites but one nesting record for Erie (*Birds of Erie and Presque Isle*, 1904, 575), which indicates that the advent of this species to the present region has been within comparatively recent years.

Mr. Kirkpatrick noted a male and female at Meadville on December 25, 1884. So far as I have been able to determine, this is the earliest record for the species in this section of the State. At that time both Mr. Kirkpatrick and Mr. Sennett thought that this pair might be escaped cage-birds. Cardinals were not seen in any considerable numbers until 1897 when several pairs were observed. By 1903 they were fairly numerous and were often seen. Mr. Kirk-

patrick says concerning its present status at Meadville: "It has been noted every month in the year, except August, September, and October; it is more often seen during winter than at any other time, and during cold spells occasionally ventures into the residential districts of the city."

We found it quite common in certain fixed areas of Pymatuning, particularly in the hawthorn-covered fields about three miles north of Hartstown. On May 12, 1922, an unfinished nest was found along Randolph's Run, east of Hartstown. On May 24 this nest held three eggs. On May 18 a nest with three fresh eggs was found near Shermansville; on May 19 a low-built nest and two much incubated eggs were found, and on May 25 an unusually large set of four eggs was collected north of Hartstown from a nest in a buck-thorn bush. A nest found two miles east of Hartstown was built in a hemlock.

On June 1, 1924, about fourteen pairs of Cardinals were seen, whereas during 1922 only about half that number had been noted during our observations covering the entire spring season. Therefore it may safely be inferred that the Cardinal is on the increase, taking the place of more northern forms of bird-life, as ecological conditions are changing.

Probably all of the Cardinals of the Swamp spend the winter thereabouts, although but few were seen from February 17 to 21, 1925.

174. *Hedymeles ludoviciana* (Linnæus).

ROSE-BREADED GROSBEAK (595).

From 1875 to 1885 Mr. Kirkpatrick found this species abundant in suitable localities about Meadville. Warren states that Sennett found it to be a "regular and rather plentiful summer resident, nesting in the low trees and bushes" (*Birds of Pennsylvania*, 1890, 246). Mr. Todd found it common about Linesville and Hartstown in the late spring of 1895, 1897, and 1898. However, all observers seem to agree that it is rare today. Mr. Kirkpatrick believes that its disappearance may be accounted for by the demand for these songsters as cage-birds which developed at the time of their greatest abundance. He states: "The remarkable vocal powers and striking plumage of the male made it so conspicuous that it soon became well known to the residents of Meadville, and numbers of them were confined in cages. They were in such demand that their nests were almost constantly

searched for in season. The young were taken from the nests when they were only a few days old and were easily reared."

It sometimes arrives in late April: April 25, 1896, Meadville (Kirkpatrick); but usually in early May: May 4, 1902, May 5, 1906, May 6, 1901, Meadville (Kirkpatrick); May 10, Crystal Lake (Sutton). On May 18, 1922, two nesting pairs were located about three miles south of Linesville. On May 23, 1922, a nest with four eggs was found in a black birch tree on Cherry Island. On June 14, 1901, Mr. Kirkpatrick found two nests, each with five eggs, along French Creek near Meadville. On June 16, 1923, two males were secured by us in a wild portion of the Swamp north of Hartstown, and a nest with four small young was found. Mr. Kirkpatrick found small young near Meadville on June 16, 1900.

Concerning the nesting habits of this species Mr. Kirkpatrick writes: "In this locality their loosely constructed nests are with few exceptions built in thorn bushes or in the common alder from five to ten feet from the ground. They are composed entirely of the light brown stems of a vinelike plant which I believe to be bind-weed. The eggs can be seen through the bottoms of the nests. Sets vary from three to five eggs, but five are less commonly found than three or four. As a rule, when the birds are sitting on the nests they are quite tame and fearless, sometimes refusing to leave the nest until they are almost touched with the hand. They seem to be socially inclined. A dozen nests were found in the vicinity of Kennedy's Riffles within the space of only a few acres."

In the fall most of the birds seen are silent, but occasionally one bursts into song. On September 4, 1925, an immature bird in the moult was shot at Conneaut Marsh. As late as September 24, 1925, several individuals were seen, chiefly about Crystal Lake. The moult of one bird, which was closely observed for several days about Lower Lake, was apparently complete on September 14, 1925.

175. *Passerina cyanea* (Linnæus). INDIGO BUNTING (598).

Common as a summer resident in all the extensive thickets and along the edges of the upper woodlands; not common as a migrant, since only a comparatively small number pass to the northward to nest. In the spring it is practically never found in the Swamp; in late summer and fall, however, it may be found almost everywhere

in patches of weeds, and it is particularly abundant in certain sections of the Swamp.

It arrives in early and mid May: May 5, 1894, Meadville (Kirkpatrick); May 7, 1908, and May 9, 1909, Meadville (First); May 11, 1922, Hartstown (Sutton); May 15, 1925, Conneaut Lake (Langdon). On May 11, 1922, four males appeared simultaneously in one spot, where it is positively known they were not present on the preceding day. A brilliantly colored male was secured on May 24, 1925, not far from Hartstown. Nests with full sets of eggs are to be found before the end of May. On May 26, 1922, a nest with one egg was found in a raspberry vine not far from Stewart's Corners, about two and one-half feet from the ground. On May 28 another nest, only partly constructed, was found in a briar patch at the edge of a woodland road not far from Hartstown. On May 29 a full set of four eggs was taken from the nest which had been discovered on May 26, and two additional incomplete nests were discovered nearby. Mr. Kirkpatrick found nests near Meadville on June 12, 1909, and August 8, 1898. The first of these nests held three eggs; the other nest, which held but two eggs, and which may have been deserted, was built far in the woods in a shaded spot.

During August and September, 1925, Indigo Buntings were seen daily everywhere about Crystal and Lower Lakes. An immature male in perfect plumage was secured on September 18, 1925. On this date a loose flock of at least forty young birds was observed. They were all wild and nervous, and stayed in the alders at the edge of the lake, rather than in the dry thickets which they usually inhabit. Doubtless food conditions are better in the swampy thickets at this season than they are in the higher regions. Several were seen on September 23, and they probably remained considerably later.

Spiza americana (Gmelin). DICKCISSEL (604).

Mr. Samuel E. Bacon regarded this species as a rare summer resident at Erie (Todd, *Birds of Erie and Presque Isle*, 1904, 576). Mr. Fred L. Homer took an adult female at Transfer, near Greenville, Mercer County, during the spring in 1888. This specimen was preserved, and is at present in the Carnegie Museum, Pittsburgh. From these statements we may be led to expect the presence of the Dickcissel as a summer resident in the present region. We have, however, no records at present.

176. *Piranga olivacea* (Gmelin). SCARLET TANAGER (608).

A common migrant and summer resident throughout the Swamp and upper woodlands from early May until late September. It arrived on May 4 in 1922 and was abundant by May 10, in the vicinity of Hartstown. Mr. Kirkpatrick's first dates for Meadville are as follows: May 5, 1906; May 16, 1892.

On May 11, 1922, two pairs were seen south of Hartstown on Cherry Island and an incomplete nest was found. On May 23 about twelve birds were recorded and one male was secured in the environs of Cherry Island. On June 1 a nest and four eggs were found by Mr. Merl Hutchens, high in a beech tree on a slender horizontal limb. On May 30, 1923, a nest and four eggs were found in a very large beech tree southwest of Linesville. Mr. Kirkpatrick found a nest with four well incubated eggs on June 3, 1899, near Meadville. In 1925 nesting Scarlet Tanagers were abundant in the woods about Conneaut Lake.

Male birds observed from August 22, 1925, onward were in all stages of moult. A male shot on August 22 was almost altogether green. One shot on August 25 was roughly speaking half green and half red. Family groups were seen together until September 19. A call resembling the syllables "cher-u-ee" was often heard. A male seen on September 22 seemed to be in full winter plumage. A loose flock seen on September 24 probably remained a few days longer in the region before departing for the south, but they were not subsequently actually observed.

177. *Progne subis subis* (Linnaeus). PURPLE MARTIN (611).

A rather uncommon migrant and very local summer resident found chiefly about the towns and farms near human dwellings, and practically never in the wilder portions of the region, where it doubtless originally nested. Mr. Kirkpatrick states that forty years ago it was abundant in Meadville, where scores of nesting-boxes had been erected by interested citizens; but after these boxes decayed they were not replaced with new ones and the Martins have therefore disappeared.

It arrives in early April: April 2, 1897, Meadville (Kirkpatrick); April 6, 1908, Meadville (First); April 13, 1924, Shermansville (Bergstrom); April 15, 1925, Conneaut Lake (Langdon). On May 2, 1922, we found eight occupied nests in two nesting-boxes at Conneaut Lake.

Fully twelve pairs of birds were seen at that time. A single pair of Martins nested at Hartstown in the spring of 1918, but they deserted their eggs without rearing their young. Small colonies occur at the present time at several farms in the region and at the Erie Railroad Shops at Meadville. Mr. Todd saw a large colony at Linesville on June 16, 1897.

In the fall it lingers about in small groups until the middle of August. So far as I have been able to learn, it does not assemble in very large pre-migratory flocks anywhere in this region. Family groups have been seen by us near Hartstown on August 9, 1924, and from August 23 to 31, 1925, near Crystal and Lower Lakes. The local summer residents probably move to some nearby point, where they join the great flocks before journeying to South America. Perhaps they fly from here directly to New Jersey and Delaware where such flocks are known to gather with great regularity.

178. ***Petrochelidon albifrons albifrons*** (Rafinesque).

CLIFF SWALLOW (612).

A common, and, so far as our observation goes, regular migrant and summer resident from late April to late August, nesting only under the eaves of barns and similar buildings, and most abundant at the farms which occur along the edge of Pymatuning Swamp. Mr. Kirkpatrick's earliest date for Meadville is April 18, 1898. This observer reports that the Cliff Swallow has entirely disappeared during recent years in the vicinity of Meadville, although it was formerly numerous.

On April 25, 1922, it was numerous at Shenango, according to the station-master there, and it was abundant at Hartstown on April 27. From then on it was seen every day; but it did not mingle with the large flocks of swallows, which circled over Crystal Lake on April 28, 29, and 30. On May 11, 1922, four pairs were found building nests on a barn at the edge of Hartstown. By May 14 two of these nests were finished and three more started. On May 24 six new nests were started on the opposite side of this barn, and it was noted that both sexes often stayed in the completed nests at the same time, perhaps incubating. On May 29 a large colony was located on a barn about two miles north of Hartstown, twenty-two finished nests being counted. On May 30 sets of four and six eggs were collected and a male bird secured. Two birds flew from each nest when the colony was visited at night.

In an interesting letter Mr. J. G. Crumb of Linesville writes: "You may be interested to learn of a colony of Cliff Swallows that nest around the buildings of D. A. Burt, who lives on a farm in the Swamp. The last time I visited his place in the summer-time I counted seventy-six occupied nests along one side and end of his barn. There were many more along the other side, but I did not count them. I might add that Mr. Burt wages constant warfare against the English Sparrows."

It was most interesting to watch the birds constructing their nests. Their actions reminded me of large bees, or wasps, and the white frontal mark on their dark heads gave them a strangely insect-like visage. Certain call-notes rather resembled the squeaks and grating sounds produced by rubbing tautly stretched wet rubber with the thumbs and fingers. The mud for their nests was obtained from the barnyard where a spring, or water-trough, made a muddy spot in the earth. Their graceful flight was noticeably more contained and deliberate than that of any other species of swallow present in the region, with the possible exception of the Purple Martin.

In the fall no very noticeable flocking movements were observed in 1925. However, small flocks were seen on August 21, and from then on for a few days. Six were seen on a wire not far from Hartstown on August 27; no others were seen that season.

179. *Hirundo rustica erythrogastris* Boddaert.
BARN SWALLOW (613).

A common migrant and summer resident from late April to early September, nesting inside suitable barns and outhouses throughout the region. Mr. Kirkpatrick's first records for Meadville are as follows: April 10, 1903; April 20, 1898; April 27, 1902. Great flocks were seen by us at Shenango and Hartstown on April 27, 1922. During 1923 Mr. Bergstrom first saw it at Shermansville on April 28. From April 28 to May 3, 1922, loose flocks roamed about the meadows or perched on the wires near Crystal Lake in company with other species of swallows. On May 3 a female, with ovaries not noticeably developed, was secured. On May 7 six mated pairs were noted. On May 10 several pairs were found building their nests, and on May 11 five more nests, almost completed, were found near Hartstown and Linesville. On May 21 a set of five eggs was taken at Hartstown, and on May 22 a set of six eggs from a nest in the same large barn. On

June 16, 1923, two nests, each with five eggs, were found underneath the bridge which spans the Shenango west of Shermansville.

Family groups assemble in loose flocks during the middle and latter part of August, and in 1924 were seen as late as September 14 in the vicinity of Conneaut Lake. In 1925 great flocks were seen on August 25 at Conneaut Lake; they were observed thereafter daily until September 14, on which date three birds were seen.

180. **Iridoprocne bicolor** (Vieillot). TREE SWALLOW (614).

A regular and abundant migrant, and irregularly common summer resident from early April to the middle of September, nesting exclusively in the wooded Swamp, and about the edge of Conneaut Lake. Residents of Hartstown state that the first Tree Swallows appeared in the region a week earlier than the first Purple Martins, in other words on about April 8. Mr. Kirkpatrick saw them on April 9, 1897, and April 24 in 1904 and 1909, at Meadville.

When we arrived at the Swamp on April 27, 1922, many of the birds were plainly mated, although large transient flocks were still lingering about Crystal Lake with other species of swallows. Tree Swallows were most numerous in flocks on April 29, at which time a male was collected. Shortly thereafter the flocks broke up, and by May 7 no birds were seen in flocks, and all observed had chosen nesting-sites at varying heights from the ground in the dead stubs standing about in the Swamp. On May 11 the birds were hunting nesting material everywhere. They did not use cat-tail down, but visited the neighboring farmyards for feathers. On May 13 a nest with two eggs was found thirty-five feet up in a dead stub in the deserted nest of a Downy Woodpecker. From May 27 to 30 new nests were found daily, some of them in the wildest portions of the Swamp south of Linesville, and most of them in stubs, the bases of which were either so inaccessible, or so weak, that the nests themselves could not be examined.

On May 30, 1923, Mr. John B. Semple and I collected a nest and four eggs from an old Downy Woodpecker cavity only about eleven feet from the ground. This nest was lined with soft feathers including one large humeral from a white Pekin Duck. The set of four fresh eggs was probably incomplete.

During 1924 and 1925 no nests were located, although adults and young were observed on August 6, 1924, at Pymatuning and Conneaut

Lake. On May 15, 1925, two nesting pairs were observed at Conneaut Lake Park. They probably had nests in a leaning dead willow not far from the hotel. On May 17, 1925, five occupied nests were found at the Swamp. On June 30, 1927 fully fledged young just out of the nest were seen at Hartstown.

But few Tree Swallows have been recorded in the fall. We saw two at Lower Lake on August 25 and 26, 1925, and about twenty at Conneaut Lake on September 8 and 9, and a few at Crystal and Lower Lakes as late as September 19.

181. *Riparia riparia riparia* (Linnæus). BANK SWALLOW (616).

A rather rare but regular migrant in late April and latter August and early September; much less common as a summer resident and very local in distribution, having nested in the region during recent years, so far as I can ascertain, in only one high, dry bank six miles east of Hartstown, and along French Creek near Meadville. Formerly it was very abundant along French Creek, according to Mr. Kirkpatrick. Mr. Kirkpatrick's first records for Meadville are as follows: April 25, 1908; April 29, 1922; May 1, 1903. On May 6 and 15, 1925, Mr. Langdon saw two individuals (probably mated) at Conneaut Lake.

A few Bank Swallows mingled with the flocks of Swallows which reached Crystal Lake on April 25, 1922, according to Mr. Hutchens. On April 27 about six individuals were seen and most of these shortly disappeared. On May 6 an adult male was secured, and two mated pairs were observed. By watching these birds I determined that they were nesting in a dry cut along the road from Hartstown to Conneaut Lake. The two nests were occupied on June 1, but I could not dig them out at the time and had no opportunity to revisit them later. Mr. Kirkpatrick's one nesting record for Meadville is May 16, 1898. Mr. John E. Bird took two sets, each of five eggs, on May 14, 1914, from burrows along French Creek. I saw these sets and their feather-lined nests in the museum of Allegheny College at Meadville. Mr. Bergstrom states that they nested at Meadville Junction Pond during 1923.

In the fall it seems that they do not congregate in this region. However, we saw them during 1925 on August 25 and '26 and many were present on August 28, after which date none was seen.

182. **Stelgidopteryx serripennis serripennis** (Audubon).

ROUGH-WINGED SWALLOW (617).

A rare and somewhat irregular summer resident from latter April to early September, and decidedly local in distribution, having been found nesting at only three points: near Hartstown; a little north and east of Adamsville; and at Conneaut Lake Park. Probably it does not occur as a migrant, since this latitude marks the northern boundary of its range.

Mr. Kirkpatrick recorded one at Meadville on May 8, 1880. Our first actual record, May 15, 1922, cannot be considered a date of arrival, since the pair noted had a nest partly finished at the time. Mr. Langdon's much earlier record for Conneaut Lake, May 6, 1925, does not certainly fix the earliest date of arrival, either, since this observer thinks he saw them a few days previously. A nest found at Hartstown on May 15, 1922, was built four feet back in a drain pipe in a church building, built of blocks of cement, and although one egg could be seen on May 17 there was no way of determining whether there were more. On May 20 two, and perhaps more, pairs of birds were found nesting on the bank (four feet high) of a small stream just north of Adamsville. On May 14 and 15, 1925, several pairs were found nesting in cracks and holes along the cement and stone abutments near the Hotel Conneaut at Conneaut Lake Park. The entrances of these nests were only about three feet above the surface of the water.

We have no fall records. Probably this species of the Carolinian Zone has come into this region only in recent years.

Bombcilla garrula (Linnæus). NORTHERN WAXWING (618).

Although we have no record at present for this irregular wanderer from the north and west, it should be looked for in winter. Mr. Todd did not record it at Erie (*Birds of Erie and Presque Isle*, 1904, 578).

183. **Bombcilla cedrorum** Vieillot. CEDAR WAXWING (619).

An irregularly abundant permanent resident, noted chiefly during spring and summer. It would seem from the records at hand that it does not customarily come to the Swamp until May. It must nest abundantly during certain seasons, however, since dozens of old nests (more than likely of this species) have been found in the alders, willows, and other lower trees.

In 1922 several were seen near Hartstown on May 13, and a large flock on May 20. On June 3 two pairs were observed building their nests in the maple trees on the grounds of the Century Inn at Hartstown. During 1923 large flocks were seen all about the Swamp, and on May 15 and 30 enormous flocks were seen and heard everywhere. On June 17, 1923, a nest and five fresh eggs were collected at Hartstown, from the same maple tree where they had nested during the previous season. On the following day two more pairs were found building their nests in the Swamp in the tops of alders. On May 31, 1924, a pair was observed selecting a nesting site. Mr. Kirkpatrick's nesting dates for the vicinity of Meadville are as follows: June 23, 1897; July 4, 1914; July 18, 1892; July 25, 1914. On July 1, 1927, Mr. Semple discovered a nest in a spruce tree at Hartstown. The female left the nest only after considerable disturbance.

In 1925 from August 21 to September 24 it was very abundant everywhere in Pymatuning. Many young birds moved noisily about with their parents. A flock of twelve was seen by Mr. Kirkpatrick about three miles south of Meadville on February 17, 1897, and eight were seen on December 19, 1911, in about the same locality by the same observer.

184. **Lanius borealis** Vieillot. NORTHERN SHRIKE (621).

A rare and irregular winter visitor, the presence of which doubtless depends upon food conditions in the far north, and thus indirectly upon the temperature and weather.

While both Mr. Langdon and Mr. Bergstrom feel sure that they have seen the species during the winter, our only positive records are furnished by Mr. Kirkpatrick. He took specimens at Meadville on December 25, 1892, January 6, 1893, and January 21, 1891. Mr. Langdon saw a Shrike at Conneaut Lake on March 21, 1925, which may have been of this species. Mr. Bacon's latest spring date for Erie was March 18 (Todd, *Birds of Erie and Presque Isle*, 1904, 578).

185. **Lanius ludovicianus migrans** W. Palmer.

MIGRANT SHRIKE (622d).

This uncommon migrant and summer resident doubtless arrives early in the spring. It is to be looked for chiefly in the open flat country west of the Swamp, where many wild apples and thorn-trees occur. A shrike seen at Conneaut Lake on March 21, 1925, by Mr.

Langdon may have been of this species, although the record is open to some question. Mr. Bergstrom secured a male at Conneaut Lake on April 11, 1926. Mr. Kirkpatrick has recorded it at Meadville on April 11, 1892, and April 16, 1908. Mr. Bergstrom saw a mated pair at Shermansville on May 26, 1926. We found a nest containing six fully fledged young ready to leave the nest on May 16, 1925, about three miles northwest of Hartstown. I had searched widely for nests during previous seasons in the very fields where the nest was found, but without success, although the region, studded with occasional thorn-trees, was ideally suited to their needs. When I approached this nest the parents flew at me briskly, calling in harsh tones and biting savagely at my hands when I reached in to touch the young birds, which so completely filled the nest that I could not easily determine the material of the lining, nor the depth of the cup. The young were silent, but squirmed a little when touched. The gray plumage of their heads and backs was edged distinctly with brownish. In the red-haw tree, where the nest was built, were numbers of dead beetles and grasshoppers, and remains of mice, small snakes, and a small bird, probably a Tennessee Warbler. Mr. Bergstrom had the good fortune to find a nest and four young in this same field on May 28, 1926. Mr. Kirkpatrick found it nesting at Meadville on May 17, 1880. Mr. Bergstrom noted it near Shermansville on June 3 and 4, 1926. These birds, too, were probably nesting. On June 30, 1927, we observed two in a field three and one-half miles north of Hartstown.

All observers seem to agree that the species nests regularly in Erie County (Todd, *Birds of Erie and Presque Isle*, 1904, 578) and Warren includes Crawford County in the known breeding range of the bird without citing actual records (*Birds of Pennsylvania*, 1890, 261).

Although I looked for it, particularly the young of the year, during the fall of 1925 I did not detect it.

186. *Vireosylva olivacea* (Linnæus). RED-EYED VIREO (624).

An abundant migrant and summer resident, occurring chiefly in the deciduous woods of the uplands from May to October. Our earliest date of arrival, May 5, 1922, seems to be noticeably earlier than that cited by Mr. Todd for Erie, May 12 (*Birds of Erie and Presque Isle*, 1904, 579). On May 11, 1922 they were abundant everywhere.

Nest-building apparently commences soon after arrival, for partly finished nests were located on May 14, and two pairs were found build-

ing on May 15, 1922, near Hartstown. Nests ready for eggs were found on May 19, 24, and 26, the last of which held one egg of the Cowbird. Four nests were found in the low maple saplings of the woods northwest of Hartstown, three of which were ready for eggs, and one held two eggs, and the sitting female allowed very close inspection. A nest and four eggs were collected on June 1. It would seem that some of the birds are delayed in nest-building, however, since nests just finished were located on June 3, 1922, and as late as June 17, 1923. Eighteen nests in use were found during 1922 and 1923, and in only four of these were found eggs or young of the Cowbird. This proportion is very small, it seems to me, since in nests of the Red-eye found in Brooke County, West Virginia, during the years 1914-1918, fully fifty percent of the nests held eggs or young of the Cowbird. Mr. Kirkpatrick found nests on June 19, 1913, and June 26, 1909, at Meadville. I found a nest with three eggs (and one of the Cowbird) on July 1, 1927, near Crystal Lake.

A female shot on August 29, 1925, was in the midst of what seemed to be a partial moult. All during August I heard juvenal males trying to sing. I saw several at Lower Lake as late as September 24. Mr. Bergstrom saw one on October 2, 1925, at Shermansville.

187. *Vireosylva philadelphica* Cassin. PHILADELPHIA VIREO (626).

A transient visitant, which probably is much commoner than our records show. Individuals recorded at Hartstown from May 17 to 24, 1922, were seen in the comparatively low growths, although never in the distinctly swampy areas of the region. One bird observed near Shermansville on May 31, 1923, and two at Lower Lake on May 31, 1924, doubtless indicate the approaching end of the spring migration, and may, indeed, be rather late records. In 1925 two were seen at Crystal Lake on May 16. It is notable that the birds observed during the middle of May, 1922, and on May 16, 1925, were not singing. Those seen on May 31, 1923 and 1924, sang incessantly. This was doubtless due to the proximity of the nesting season.

Our only fall record is of an immature female seen on September 7, 1925, at Crystal Lake, and collected on September 8. It was with a roving band of Warblers, and was quite tame. This bird remained altogether in the low alder growth, and never flew to the higher trees. Diligent searching for the species failed to discover it again.

188. *Vireosylva gilva gilva* (Vieillot). WARBLING VIREO (627).

A migrant and summer resident, apparently never so common as the Red-eyed Vireo, and almost never seen in the wilder woodlands, preferring to nest about the shade-trees in the towns, or occasionally in isolated large trees growing along the roads, in open fields, or on the wide flood-plains of the streams. It was seen from May 2 onward, during 1922, at Hartstown. Mr. Kirkpatrick's earliest date for Meadville is May 2, 1908. On May 26, 1922, a pair was observed for hours building their nest in a tall red maple near Hartstown. They were seen with cobwebs and the egg-sacks of spiders in their bills, and they literally spent hours tearing rough paper from a perpendicular sign-board where they could not gain a foothold. But two nests were found, and both were quite inaccessible, although one found on May 31, 1923, high up in a tulip poplar, probably held eggs, since the female was sitting. Mr. Kirkpatrick found a nest at Meadville on June 24, 1886.

During August and early September, 1925, Warbling Vireos were seen and heard almost daily. I saw the last individuals on September 19, in the higher alders to the south of Crystal Lake.

189. *Lanivireo flavifrons* (Vieillot). YELLOW-THROATED VIREO (628).

A common migrant and summer resident from early May until the middle of September. We collected a male at Hartstown on May 2, 1922, our earliest recorded date of arrival. Shortly thereafter about twenty pairs were located. Mr. Kirkpatrick's first records for Meadville are as follows: May 8, 1909; May 10, 1892 and 1902; May 12, 1906. Mated birds were found to be very much attached to each other, and it was quite unusual to see one bird by itself. On May 11, 1922, a female bird with spider-webs in her bill was closely watched for over an hour. She disappeared in the top of an enormous swamp maple, where, even after an arduous climb, it seemed impossible to locate the tiny nest. After much difficult waiting both birds suddenly came to the tree-top, the male twittering ecstatically. The female went to the nest, and in a most dainty manner plastered the deep structure with large lichens she had been gathering. When I moved a little, both birds saw me and set up a loud, harsh scolding, which did not cease until I dropped from the low-hanging boughs of the tree. This nest held three eggs on May 24, and was collected on May 26.

While I was near the nest the parent birds fought incessantly, dashing at me while they squealed and snapped their beaks. In the meantime, on May 15 another nest was located, high in a tulip poplar. Mr. Kirkpatrick found a nest at Meadville on May 18, 1880.

The Yellow-throated Vireo is usually seen in the tops of the higher trees. As a rule it preferred the big trees growing at the edge of the woodlands or in the middle of a field. The Warbling Vireo, on the other hand, preferred the shade-trees in town, and the Red-eye, of course, hung its pensile cradle from the lower boughs of the saplings, deep in the big woods. Only the Blue-headed Vireo was regularly found in the Swamp proper, although the Red-eye, associated with the Scarlet Tanagers, sometimes was seen among the black birches.

Our only fall date is September 4, 1925. At this time I saw two birds in a high beech tree, north of Hartstown.

Vireo griseus griseus (Boddaert). WHITE-EYED VIREO (631).

A very rare bird in western Pennsylvania. It is said to be common at Jefferson, Ashtabula County, Ohio (Jones, *Birds of Ohio*, 1903, 171). Mr. Todd did not find it at Erie (*Birds of Erie and Presque Isle*, 1904, 580).

190. **Lanivireo solitarius solitarius** (Wilson).

BLUE-HEADED VIREO (629).

A rather common migrant and rare summer resident, which in former years may have been commoner during summer. A bird seen on April 28, 1922, approximately marks the beginning of the spring migration. During 1922 a few birds were seen so late as May 22, which is doubtless late for migration. Mr. Todd recorded one individual near Hartstown on his first trip to the Swamp on June 25, 1895. We noted mated pairs north of Hartstown on May 31, 1924, and on June 18, 1923; and on July 2, 1927, a pair were seen near Linesville. An old Vireo nest, apparently too large and deep for that of a Red-eye, was found at the tip of a low hemlock bough, deep in the Swamp. This may have been a deserted nest of this species.

In the fall, however, it is apparently more often recorded than any other member of its family. Mr. Kirkpatrick saw one near Meadville on September 18, 1911. Mr. C. J. Seiple saw one at Greenville (Mercer County) on September 20, 1925. Mr. Bergstrom saw one at Pymatuning on October 2, 1925, and Mr. Kirkpatrick took one near Meadville as late as October 14, 1911.

191. **Mniotilta varia** (Linnæus). BLACK AND WHITE WARBLER (636).

Common as a transient visitant, rare as a summer resident. Mr. First recorded it at Meadville on April 27, 1909, and on April 28, 1914. Mr. Kirkpatrick's earliest record for Meadville is April 27, 1908. Mr. Langdon recorded it at Conneaut Lake on April 29, 1925. In 1922 the first one was seen on May 1 near Hartstown. A pair seen June 1, 1924, near Shermansville were doubtless nesting, although we could not locate the nest. Mr. Kirkpatrick found a nest containing four eggs near Meadville on June 4, 1910, and on June 27, 1903, found three young a few days old and one egg lying on the ground outside the nest. In the spring of 1925 the birds were very rare, and only two were seen among the hosts of migrating warblers, on May 16.

In fall too, this species seems to be rather rare at Pymatuning. One immature bird was seen on September 2, 1925, and on subsequent dates, as late as September 21, the species was seen almost daily, but in small numbers.

192. **Helmitheros vermivorus** (Gmelin).

WORM-EATING WARBLER (639).

While this Carolinian species might reasonably be expected to nest where the Cardinal, Rough-winged Swallow, and Tufted Titmouse are known to occur, our two records for Pymatuning Swamp, May 12, 1922, and May 15, 1925, must for the present be considered as representative of northward wanderings of a more southern bird. On each of the above dates but one bird was seen. It is probable that this species will eventually invade the present region as the more northern ecological conditions disappear. Mr. Todd did not include it even hypothetically in his list for Erie (*Birds of Erie and Presque Isle*, 1904, 580).

193. **Vermivora pinus** (Linnæus). BLUE-WINGED WARBLER (641).

During Mr. Todd's visits to Pymatuning in 1895, 1897, and 1898 he apparently did not record this species, although Warren speaks of having seen it sparingly in Crawford County during the summer (*Birds of Pennsylvania*, 1890, 276). Today it is unquestionably one of the most abundant, widely distributed, and characteristic members of its family in the region. But its occurrence seems to depend quite definitely on a certain type of low bushy growth, which occurs along

the borders of the Swamp, particularly near the dying tamaracks and at the margins of the lakes and streams. In every spring visit we have made to the Swamp its monotonous un-birdlike song has always greeted us, and the little brush-covered valleys and upgrown edges of the woodlands nearly always were found to harbor these delightful birds. At Meadville, strangely enough, neither Mr. Kirkpatrick nor Mr. First has ever recorded it.

In 1922 it arrived in numbers on May 3, and the males were heard singing in many places. On May 4 and 5 four males were shot. They were in full plumage, and their testes were much enlarged. On May 13 the birds observed were all paired; and on May 17 two pairs were found building nests in the Swamp a mile and a half north of Hartstown. During the building of the nests the males in particular were often combative, and would chase each other about through the black raspberry-bushes, or through the dense willows. From all sides came their odd, droning songs, like the murmur of great bees. One nest found ready for eggs on May 23, 1922, was unfortunately deserted. This nest was probably a little late, for nests found on June 1, 2, and 3, 1922, held eggs, which were at the point of hatching, or small young. One nest (containing five young) found near Atlantic on June 1, 1924, was most beautifully built into the base of a small clump of bushes, and arched over with crisp and loosely interwoven dry leaves.

The songs of the Blue-wing were found to merit close study. The characteristic performance of the arriving birds, as noted, was always the well known "eee-zeee" with the inhalant-exhalant quality mentioned by Chapman (*Birds of Eastern North America*, 1914, 442) and other authors. By May 29 a second song was characteristic. This song has also been noted by students. But a third song, unlike either, was often heard, particularly during the building of the nest, an elaborate and broken up rendition of the simple "eee-zeee", or "swee-chee" (as Chapman has written it) which somewhat resembles the song of the Nashville Warbler. The song might be written "swee, pit, chi chi chi", the latter three notes with an exhalant quality. On September 1, 1925, a male was heard singing "chi chi chi chi chi chi chi-zeee".

During fall the Blue-wings are more frequently observed in the deciduous woods of the uplands than at any other season. Here on August 21, 1925, an immature female was shot, which I believe was a member of one of the first of the migrating flocks. Blue-wings were

seen daily until September 19. Sometimes they occurred in the low alder growth, but more often in the higher trees. Three immature specimens were taken.

194. *Vermivora chrysoptera* (Linnæus).

GOLDEN-WINGED WARBLER (642).

A summer resident, much rarer than the Blue-wing, and found nesting only in four localities in the present region, although Mr. Kirkpatrick has found it near Meadville, where he has never recorded the Blue-wing. A mated pair were observed on May 11, 1922, near Hartstown. Another pair, found nesting in the new growth between the dead tamaracks west of Shermansville, were observed for some time on May 14, 1922. Single birds or pairs were subsequently observed on May 16, 1923, June 1, 1924, May 16, 1925, and June 30, 1927 (female feeding young). Mr. Todd saw one near Hartstown on June 16, 1898. Mr. Kirkpatrick found a nest and four eggs near Meadville on June 19, 1913. The present species was found more often in the upper brushy pastures than the Blue-wing.

In the fall of 1925 I saw but one Golden-wing, an adult male, near Atlantic on September 17.

Vermivora leucobronchialis (Brewster). BREWSTER'S WARBLER.

While there is nothing particularly significant about the finding of this hybrid in the region, aside from the indication that both its parent strains must occur near at hand, it is indeed interesting to find a nesting pair of birds in which both male and female show strong tendencies toward being typical of the present hybrid form. Such a nesting pair, with their three much incubated eggs and two young, were found near Hartstown by Mr. Thomas on June 6, 1922, and subsequently sent to me. In the male of this pair the plumage is even more perfectly representative of both parents than in the form as originally described by Brewster, the breast being pure white. The female bird, moreover, lacks altogether the characteristic facial markings of the female Golden-wing, although her wing is marked as in the Golden-wing and her entire breast is strongly yellowish as in the Blue-wing.

On August 29, 1925, near Hartstown I secured an adult male, which is quite typical of this form. It was singing the characteristic song of the Blue-winged Warbler.

195. *Vermivora ruficapilla ruficapilla* (Wilson).

NASHVILLE WARBLER (645).

A common transient visitant in spring and fall, which occasionally nests in the wilder portions of the Swamp, though probably not so

commonly as in former years. During spring migration it arrives in early May: May 2, 1904, Meadville (Kirkpatrick); and May 31, 1923, Lower Lake (Sutton). Mr. Todd recorded an adult male in full song on June 16, 1898, near Linesville. This record strongly suggests that it may have been a summer resident at that time. This bird stayed among the lower bushes and tamaracks. We recorded one individual at Shermansville as late as June 1, in 1923, and found two nesting pairs near Lower Lake on June 29, 1927. Mr. Samuel S. Dickey has found it nesting at Cambridge Springs, Crawford County, during recent years.

In the fall season of 1925 it appeared on September 2 at Crystal Lake and was recorded until September 22, when one adult was seen at Lower Lake. One immature female was taken on September 11 at Dollar Lake.

196. *Vermivora celata celata* (Say).

ORANGE-CROWNED WARBLER (646).

Mr. Todd found this species characteristic, but rare as a fall migrant, at Erie (*Birds of Erie and Presque Isle*, 1904, 580) but does not mention it as a spring bird. The two birds seen and heard at Crystal and Lower Lakes, (one of which was collected and lost) on May 12, 1922, may therefore comprise a rare record. My experience with the species is that it is most difficult to identify either by song or color. One was seen in the fall on September 19, 1925, at Lower Lake. In all these cases the birds were seen in the dense alder growths, not far from water.

197. *Vermivora peregrina* (Wilson). TENNESSEE WARBLER (647).

A transient visitant, apparently rare in the spring and easily passed by, unless attention is attracted to it by the song; but rather abundant in the fall. Mr. First recorded it at Meadville on May 6, 1913, and May 14, 1914. We recorded it near Hartstown on May 11, 1922 (two individuals seen), and on May 16, 1925.

On September 5, 1925, three immature birds were seen at close range, near Crystal Lake. On September 7 they were abundant everywhere, and an immature female was collected; by September 12 they were decidedly the most abundant bird anywhere about Crystal and Lower Lakes. On September 22 two were seen, and none was noted thereafter. Mr. Kirkpatrick took one at Meadville on September 11, 1911.

198. **Compsothlypis americana pusilla** (Wilson).
NORTHERN PARULA WARBLER (648a).

A transient visitant, fairly common in spring; rare as a summer resident. We saw it at Hartstown on May 6, 1922, and from then on to latter May, at which time it was difficult to distinguish the transient individuals from the few mated pairs which had remained to nest. On June 3, 1922, a pair were observed building a nest in a partially dead hemlock about three miles south of Linesville. The female bird was collecting principally moss; but the exact location of the structure was not determined. On June 1, 1924, a mated pair were observed near Shermansville and watched for some time. On July 1, 1927 a nesting pair were noted near Linesville.

Messrs. Sennett and Kirkpatrick found a nest and two eggs near Meadville on May 20, 1880. Mr. Kirkpatrick describes the location of this nest as follows: "It was built approximately forty feet from the ground, in a soft maple-tree, one of many other kinds that stood in those days along the south bank of Van Horn's Run, a short distance west of the stone culvert, where the Mercer Pike crosses it. Many of the branches of this tree as well as of some other trees in the neighborhood were covered with bunches of moss over two inches in length. The nest, which was constructed of moss, scantily lined with fine wiry grasses, was securely fastened to the extremities of a bunch of this moss that was living upon a horizontal branch one-half an inch in diameter." Mr. Todd saw several mated pairs near Hartstown on June 25, 1895; and on June 16, 1897 he saw several south of Linesville in the tamaracks.

Strange to say, we did not see it at all in the fall during 1925, and have at present no fall records.

199. **Dendroica tigrina** (Gmelin). CAPE MAY WARBLER (650).

A migrant, usually very rare in the spring, but regular and sometimes abundant in fall. Our spring records are as follows: May 10, 1914, and May 12, 1912, Meadville (First); May 14, 1922, and May 16, 1925, Hartstown (Sutton); May 21, 1910, Meadville (Kirkpatrick).

In the fall of 1925 it appeared on September 1, on which date I collected an immature male from a willow copse north of Hartstown. On September 7 two were seen near Crystal Lake. From September

8 to 21 they were abundant, a female being collected on September 11 near Atlantic. The autumn Cape May Warblers were noticeably tamer and more deliberate than the Tennessee Warblers, which were nervous and rather wild. Most of the Cape May Warblers were seen in the willows and alders. Birds which were recognizably adult did not appear until September 17; all seen previously were unmistakably immature. Mr. Kirkpatrick took an adult male at Meadville on September 19, 1911.

200. *Dendroica aestiva aestiva* (Gmelin). YELLOW WARBLER (652).

An abundant migrant and summer resident, nesting not only in the wildest portions of the Swamp, but in the willows along the streams, and occasionally in the shrubbery about the towns and farmyards. It arrives late in April: April 24, 1913, Meadville (First); April 29, 1906, Meadville (Kirkpatrick); April 29, 1926, Shermansville (Bergstrom). On April 28, 1922, two singing males were seen near Hartstown. A female was secured on May 3. It is my belief that this was the date of arrival for the females, since I watched closely for them on the preceding days. From May 6 onward nests were found in various stages of construction. By May 12 several nests were ready for eggs. On May 18 a nest with one egg was located, and by May 20 nests with full sets of four and five eggs were found almost daily. Forty-three nests in all were found. Only eight of these held five eggs, and most of them held four. A Cowbird egg was found in only one nest. This is most unusual, but is due, as elsewhere stated, to the protection against these parasites afforded by the Red-winged Blackbirds which would not tolerate a Cowbird anywhere about the marshes. Many of the Yellow Warbler nests were built at surprisingly short distances above the ground or water. Nests were most often found in the wild-rose, willow, and black alder growths. Mr. Kirkpatrick found nests near Meadville on May 21 and May 30, 1898.

In the late summer and fall of 1925 Yellow Warblers were surprisingly rare at Pymatuning, this seeming rarity perhaps being partly due to their silence and seclusiveness during the period of the moult. An immature male was seen and collected on August 28, about two miles north of Hartstown. An adult male was seen on September 16 at Crystal Lake. An immature female was seen on September 18-20, and collected on September 21 near Crystal Lake. In every instance these birds were alone, and not part of a flock of warblers. It is

thought that the birds seen in September were migrants from farther north. The specimen taken in August was probably a locally hatched bird.

201. *Dendroica cærulescens cærulescens* (Gmelin).

BLACK-THROATED BLUE WARBLER (654).

A transient visitant, apparently commoner in fall than in spring. Although Warren states that Kirkpatrick regarded it as a "regular breeder" in Crawford County (*Birds of Pennsylvania*, 1890, 269) we have yet to find its nest in Pymatuning, and judge that Mr. Kirkpatrick referred in his statement to the eastern and higher parts of Crawford County where it may nest regularly. It may be that the principal reason for the absence of this species in Pymatuning is that there is no rhododendron growth here.

In spring it arrives during the first or second week in May: May 5, 1907, Meadville (First); May 9, 1908, Meadville (Kirkpatrick); May 10, 1922, Hartstown (Sutton). It stays until about the first of June: June 1, 1924, Crystal Lake (Sutton). An adult male was taken by us on May 10, 1922, near Hartstown, and by Mr. Kirkpatrick on May 15, 1903, at Meadville.

In the fall it usually appears a little later than most of the warblers, although Mr. Kirkpatrick took one near Meadville on August 30, 1922. In 1925 we did not see any until September 11, on which date they were fairly common at Crystal Lake. They were not seen after September 24, although they may have remained later.

202. *Dendroica coronata coronata* (Linnæus).

MYRTLE WARBLER (655).

A common migrant, appearing among the earliest warblers in the spring, and often lingering later than any other species of its family in the fall, but not occurring, so far as is known, as a winter resident, as it is known to occur at Erie (Todd, *Birds of Erie and Presque Isle*, 1904, 482). In spring it usually arrives in late April: April 27, 1908, Meadville (Kirkpatrick); April 28, 1922, Hartstown (Sutton); April 29, 1925, Conneaut Lake (Langdon). It is common for about two weeks, and departs about the middle of May: May 13, 1901, Meadville (Kirkpatrick); May 15 and 16, 1925, Hartstown (Sutton).

In the fall it appears decidedly later than most of the warblers. In 1925 a careful watch was kept for it, but it was not detected until

September 17, on which date two were seen in the dead tamaracks near Lower Lake. By September 21 they were very abundant, and they were seen commonly to the end of our stay. Mr. Bergstrom saw them again on October 2, 10, and 24, near Shermansville. Mr. Kirkpatrick's fall records for Meadville are: October 4, 1911; October 18, 1903; October 20, 1897.

203. ***Dendroica magnolia*** (Wilson). MAGNOLIA WARBLER (657).

An abundant migrant and fairly common summer resident. It arrives early in May: May 2, 1922, Hartstown (Sutton); May 3, 1913, Meadville (First); but it does not become abundant until about a week later: May 10, 1922, Pymatuning Swamp, only males seen, one male taken (Sutton). By May 13, 1922, both males and females were present everywhere and some were obviously mated. On May 18 the mated pairs were building nests, and a well built nest, neatly set in the terminal portion of a low hemlock bough was found on May 20, about two miles south of Linesville. Mr. Kirkpatrick found a nest with three partly incubated eggs near Meadville on May 27, 1880. These records confirm Warren's statement that this species has been known to nest regularly in Crawford County (*Birds of Pennsylvania*, 1890, 283). The wave of the migration is passed by the middle of May, so that individuals which remain later may with some assurance be regarded as summer residents.

In the early fall the locally reared young are much more in evidence than the adults. An immature female taken near Hartstown on August 25, 1925, had not quite completed the moult. An immature male taken August 28 was in fine feather. I believe that migrants from farther north arrived on August 31. They were common until the end of September. It was noted more than once that this species responded most quickly of all the warblers to an imitation of cries of distress. It was usually possible to recognize them by their nervous, energetic movements, even though their colors could not be discerned. It was unusual to see many Magnolia Warblers together during the fall.

204. ***Dendroica cerulea*** (Wilson). CERULEAN WARBLER (658).

A common summer resident, restricted, however, to the deciduous woods of the uplands, particularly the beech groves, and never found in the Swamp proper. Mr. Kirkpatrick's dates of arrival for Mead-

ville are as follows: May 8, 1909, and May 13, 1901. On May 11, 1922 two males were observed near Hartstown. Thereafter they rapidly became abundant and a female was observed building her nest on May 15, only about twenty feet under the occupied nest of a Cooper's Hawk. I watched this extremely dainty little creature bring spider-webs, mosses, and bits of dead beech flowers from her quick, fluttering trips, and she eyed me confidently all the while she worked. The trim, shallow nest was saddled eighteen feet out on a slender horizontal bough. The collection of this nest and set on May 24, 1922, was an exceedingly difficult undertaking. The eggs were, of course, fresh. On May 16, 1923, a male was secured. Mr. Kirkpatrick took a male near Meadville on July 16, 1897, and I secured a male on May 16, 1923, not far north of Hartstown.

In the fall we had very poor success in detecting this species. Two immature birds were seen two miles north of Hartstown on August 25, 1925. This is our only fall record.

The abundance of this species so far north as this leads us to believe that it may now nest at Erie despite the fact that Mr. Todd did not find it there prior to 1904 (*Birds of Erie and Presque Isle*, 1904, 583). Warren states that it was known to have nested in Clinton County prior to 1890 (*Birds of Pennsylvania*, 1890, 284). If it does not now occur throughout Crawford and Erie Counties in the suitable deciduous woodlands we certainly do not understand the ecological conditions required by it.

205. ***Dendroica pensylvanica*** (Linnæus).

CHESTNUT-SIDED WARBLER (659).

Common as a migrant, but rather rare as a summer resident. May 3, 1922 (Hartstown) is our earliest date of arrival. On May 13, 1922, a pair were found building a nest about one mile north of Hartstown. This very date, May 13, according to Mr. Todd (*Birds of Erie and Presque Isle*, 1904, 583) was found to be an average date of arrival in that latitude. The birds at Pymatuning spent about a week in building this nest. On May 17 another structure, partly finished, was found. Both of these nests were in rather open situations, about four feet from the ground. One was placed near the top of a small beech sapling. On May 25 the first nest found held two eggs. During the following day a Cowbird laid an egg in the nest and punctured one of the warbler eggs. A third egg of the warbler was thrown to the

ground and the parents deserted the nest. Although considerable time was spent in search, it is our belief that only five nesting pairs were located. Mr. Kirkpatrick found nests near Meadville on June 4 and July 9, 1898. Mr. Todd saw one male south of Linesville on June 16, 1897.

In the fall the southward movement is believed to start in late August: August 22, 1925, Crystal Lake (Sutton). However, local birds were still present until September, for an adult male in the moult was seen on August 28. On September 7 several were seen, including males in full, new plumage. By September 22 they were still commonly observed, though not in the large roving flocks, which were so noticeable during the first and second weeks of the month. Mr. Kirkpatrick's latest record for Meadville is September 23, 1906.

206. *Dendroica castanea* (Wilson). BAY-BREASTED WARBLER (660).

A migrant as a rule noticeably commoner in fall than in spring. It arrives about the middle of May during the vernal migration: May 14, 1913, Meadville (First); May 16, 1925, Shermansville (Sutton); May 18, 1901, and May 21, 1892, Meadville (Kirkpatrick). It lingers about the Swamp for about two weeks, our latest date being June 1, 1924, on which date several adult males were seen near Linesville.

In the fall it returns among the earliest of the transient warblers. I took an immature female on August 22, 1925, about a mile north of Hartstown. On August 31 another was seen. Not until September 11 did it become abundant. On September 24 it was still fairly common, most individuals being in immature plumage.

207. *Dendroica striata* (J. R. Forster). BLACK-POLL WARBLER (661).

A migrant, common in late spring and abundant in the fall. Apparently it rarely arrives before the middle of May: May 13, 1911, Meadville (Kirkpatrick); May 15, 1922, male secured, Shermansville (Sutton); May 16, 1892, Meadville (Kirkpatrick). It remains until the end of May and early June: May 31, 1923, and June 1, 1924, Pymatuning Swamp, south of Linesville (Sutton).

In the fall it appears in early September, immature birds being decidedly abundant at times. In 1925 we saw it first on September 5, at Crystal Lake. On September 7 it became numerous, and by September 11 was abundant. On September 24 it was still common and

Mr. Bergstrom says it was present at Shermansville until the end of the first week in October.

208. **Dendroica fusca** (Müller). BLACKBURNIAN WARBLER (662).

As a migrant, irregularly abundant both in spring and fall, but usually only moderately common; local and rather rare as a summer resident. It may appear as early as late April: April 29, 1914, Meadville (First); but it usually arrives in early May: May 1, 1911, Meadville (Kirkpatrick); May 2, 1922, Pymatuning (Sutton); May 12, 1906, Meadville (Kirkpatrick). During spring it is sometimes abundant in the middle of May. From May 15 to 17, 1925, I saw literally hundreds of them in the hemlocks five miles north of Hartstown. Migrants remain until about the last of May: May 28, 1892, Meadville (Kirkpatrick); June 1, 1924, Shermansville (Sutton). The summer resident individuals are always found in the densest hemlock growth. On June 29 and 30, and on July 1 and 2, 1927, several nesting pairs were located in the hemlocks three miles north of Hartstown, and in the dense woods not far south of Linesville. Their songs, which are not so loud as those of the Black-throated Green and Magnolia Warblers, may easily escape notice. On June 30 a nest with half-grown young was found high in a hemlock about three miles north of Hartstown.

Mr. Crumb has in his collection a single egg taken near Linesville, which he supposed was of the Blackburnian Warbler. I, however, feel sure that there was some mistake in identification, since this egg was taken from a nest "built in a small sapling, about four feet from the ground". The egg appears to me to be that of a Chestnut-sided Warbler.

In the fall it arrives early. An immature female (believed to be a migrant) was taken near Hartstown on September 2, 1925. An immature male was seen at Crystal Lake on September 7. By September 11 the species was abundant, particularly about Lower Lake. On September 24 it was still numerous, and Mr. Bergstrom saw it at Shermansville on October 1.

209. **Dendroica virens virens** (Gmelin).

BLACK-THROATED GREEN WARBLER (667).

Messrs. Sennett and Kirkpatrick regarded this species as a summer resident in Crawford County, according to Warren (*Birds of Penn-*

sylvania, 1890, 270). Mr. Kirkpatrick has observed it near Meadville all during June; and Mr. Todd (*Birds of Erie and Presque Isle*, 1904, 584) states that it may have nested near Erie in the coniferous woods during the period of their field-work.

We found it an abundant migrant throughout the region and a fairly common summer resident in the deeper coniferous woods in wilder portions of the Swamp. In spring it arrives late in April, or early in May: April 29, and May 3, 1922, Crystal Lake (Sutton). On May 4, 1922, it was abundant everywhere in Pymatuning in the hemlocks, and a male was secured. From May 12 to 18 the heavy wave of migration occurred; thereafter the birds observed were in pairs, the males singing from favorite perches in the tips of the lofty hemlocks. Wherever tall black birches and equally tall, slender hemlocks grew side by side, the Black-throated Green Warblers were almost sure to be found, and no less than twenty pairs were located. Mr. Todd recorded it south of Linesville on June 16, 1897, and secured an incubating female near Hartstown on June 16, 1898.

On May 27, 1922, after watching an elusive female bird for two hours I traced her to the nest, which was saddled on a horizontal bough only about twenty-five feet from the ground, in a comparatively small hemlock. The nest was very deep and beautifully constructed, its lining including bits of hair, fur, and soft feathers, and its foundational material consisting chiefly of slender and uniform twigs of dead hemlock. I climbed to this nest on May 29, believing it to hold eggs. Since it was somewhat difficult of access it may be that my long presence in the tree caused the birds to desert. At any rate, when it was collected on June 2 it held no eggs, and neither male nor female bird was seen. On June 16, 1923 a female bird was found building her nest near the main trunk of a hemlock tree, about sixty feet from the ground.

In my study of this attractive species I spent much time in the tops of the highest trees hoping I could more easily trace the birds to their nests. It seemed strange to look straight out from my "blind" into the bright faces of the singing males, who certainly put much energy into their performances. During the song periods the males were singularly quiet and even drowsy most of the time. But the appearance of any other bird, and particularly any other male warbler of their own species would awaken them to full activity at once, and they

would dart away like a flash, pursuing the interloper with snapping bill.

Considerable variation in the songs was noted, although most of them had the plaintive character which is so noticeable. One male, which I closely observed for some time, began his song with two downward notes; these were followed by two ascending notes, and the song was finished by a droning buzz which is usually the next to the last syllable in the normal song.

In the fall I believe the migrants do not arrive until the first week in September; we noted several birds from August 21, 1925, onward, but individuals collected on August 21 and 24 proved to be in the midst of the moult and I therefore believe they were local summer residents. On September 16 hordes of them appeared, and they were abundant until September 24, and probably later. Mr. Kirkpatrick took one on September 26, 1908, at Meadville.

***Dendroica kirtlandii* (Baird). KIRTLAND'S WARBLER (670).**

An extremely rare warbler, which should occur occasionally in this region as a migrant. There are many records for Ohio and Michigan, but none, so far as I know, for this part of Pennsylvania.

210. *Dendroica pinus pinus* (Wilson). PINE WARBLER (671).

Although Sennett apparently regarded this species as a fairly regular spring and fall migrant in this region (Warren, *Birds of Pennsylvania*, 1890, 291) we have but one record, that of a singing male, observed by us in a clump of low pines standing in an open field near Shermansville on April 29, 1922. When pursued, the bird did not go to the conifers in the Swamp, but, after mounting high in air, swung eastward out of sight. Mr. Langdon believes he saw one near Conneaut Lake on May 9 and 11, but since no specimen was secured this record is open to some question. Two specimens were taken in the region of Erie (Todd, *Birds of Erie and Presque Isle*, 1904, 585).

211. *Dendroica palmarum palmarum* (Gmelin).

PALM WARBLER (672).

Probably commoner as a transient visitant than our few records would tend to show. Two were seen near Hartstown on May 1, 1922, and irregularly from then onward, until May 9, at which time but one was seen at Crystal Lake. Mr. Langdon secured a male near Con-

neaut Lake on May 8, and saw others on May 9 and 10. He also took a female on May 12. Both these specimens, though they could not be saved, were clearly of this form. One was observed by us at Lower Lake on May 16, 1925; this is, I believe, a rather late record, which probably marks the termination of the spring sojourn in this latitude.

It was rare in the fall. I saw two on September 7 and one on September 8, 1925, near Crystal Lake. Apparently it is not nearly so common here as it is at Erie (Todd, *Birds of Erie and Presque Isle*, 1904, 585).

Dendroica discolor (Vieillot). PRAIRIE WARBLER (673).

Warren (*Birds of Pennsylvania*, 1890, 293) states: "In Erie and Crawford Counties Mr. Sennett has found the Prairie Warbler as a rare spring and autumnal visitor." I have not been able to ascertain just where in Crawford County Mr. Sennett observed this species, but it was likely somewhere in the Meadville region. It is regrettable that no definite data seem to have been preserved.

212. **Seiurus aurocapillus aurocapillus** (Linnæus). OVENBIRD (674).

An abundant migrant and summer resident, not only in the Swamp, but in all the suitable extensive woodlands. Mr. First saw one at Meadville on April 26, 1914. Mr. Bergstrom saw it at Shermansville on May 1, 1926. It arrived on May 2, in 1922, and was abundant during the following three days. By May 6 the birds were apparently mated, flight-songs were heard, and a male was secured with testes much enlarged. On May 10 a partly finished nest was found near Dollar Lake. Nests with fresh eggs were found near Hartstown and Shermansville on May 16, 19, 26, 29 and 30, and June 3, during 1922, and one on May 30, 1923. Only one of these nests had escaped the visitations of the Cowbird, this nest being beautifully hidden by poison ivy and wild geranium, and containing five eggs. The nest found May 16, 1922, held two Ovenbird and four Cowbird eggs, and outside the nest were two broken eggs of the owners. One nest found on June 3 held five small young, one of which was I believe, a Cowbird. Mr. Kirkpatrick found a nest with five eggs on May 20, 1899, near Meadville.

The mating antics of the birds were often amusing. They would walk about, slyly following each other through the leaves, making scarcely a sound. Then a chase would occur, often terminated by a wild flight of the male bird, during which he would sing loudly, oc-

asionally rushing into the air to deliver his flight-song, and then back into the undergrowth to sing "Teacher, teacher" loudly for a dozen times or more.

A male shot on August 22, 1925, had not quite completed the moult of the undertail coverts. Ovenbirds were occasionally seen until the end of the first week in September. On September 14, however, a large migrational flock arrived. It was common on September 24, and lingered about for a week thereafter. Mr. Bergstrom noted it at Shermansville on October 2.

213. *Seiurus noveboracensis noveboracensis* (Gmelin).

NORTHERN WATER-THRUSH (675).

Mr. Sennett found the Water-Thrush regularly abundant during the summer throughout Crawford County, according to Warren (*Birds of Pennsylvania*, 1890, 295), and Mr. Todd, during his visits in 1895, 1897, and 1898 found it common near Hartstown and Linesville. Probably it is holding its own fairly well today, although the clearing of the land causes the birds to retreat at once, and the humus-extracting projects about Hartstown have caused a noticeable local decrease.

We found it an abundant and characteristic migrant and summer resident, the occurrence of which definitely depends upon wooded swamp conditions, such as are found throughout the major part of Pymatuning. It has not been recorded as a summer resident in the outlying districts at all, though during migration it doubtless occurs in wide areas.

On April 28, 1922, two were observed. They sang brilliantly. On April 29 it was remarkably abundant, and a male bird was shot. On May 4 most of the birds seen were apparently mated, and, although one female seemed to have a nest, it could not be located. Thereafter we spent much time in searching for nests, which were so well hidden that we did not succeed in finding any with eggs. I am inclined to think that the female birds sit very closely, for we beat about the fallen trees and moss-covered stumps literally for days in our search for them, and never, so far as we knew, flushed a female bird. On May 23 a male and female specimen were collected; the female was incubating for her belly was bare of feathers. On May 30 a female was watched for over an hour. She moved about restlessly, dipping her bill in the water and running about among the marsh

marigold and tall weeds, as she fed. Then she slowly marched up a mossy bank, ducked under the root of a tall tree, and disappeared in a damp cavity. Believing that she had disclosed the location of her nest we rushed up immediately; but a half hour's search failed to reveal the slightest indication of the nest, though there was apparently no path of egress save the aperture used as an entrance.

During succeeding spring seasons it was recorded daily. It was particularly numerous between Dollar and Crystal Lakes, and in the treacherous wild swamp two miles north of Hartstown and west of Linesville. On May 31, 1924, a brood of young, just out of the nest, were observed. On June 14, 1924, at Sandy Lake, Mr. Homer and I found a fully fledged young one, which ran about at the water's edge. It was carefully guarded by its parents which called sharply on its behalf and feigned to be crippled.

Mr. Langdon hit upon a most fortunate rendition of the song of this species when he wrote it "Hurry, hurry, hurry, pretty, pretty, pretty". In fact, although this observer was in doubt about the species at the time he made his notation, I recognized the song at once, only from the syllables written.

The birds were curious, and could be "squeaked up" easily. As a rule they were not wild, and would feed unconcernedly while being trailed through the bogs. The male birds seemed not to have regular singing perches or trees, and would mount a stump, low twig, or higher tree in giving their performance.

In the fall it is singularly quiet and difficult to observe. I shot a male in handsome first plumage on August 21, 1925, near Crystal Lake. Thereafter one was seen on each of the following dates: September 1, 5, 7, and 21. On September 21 I shot a male from the bushes about the flooded outlet of Lower Lake.

214. **Seiurus motacilla** (Vieillot). LOUISIANA WATER-THRUSH (676).

Warren states that Mr. Sennett found this species nesting commonly about the streams near Meadville (*Birds of Pennsylvania*, 1890, 295). Mr. Todd did not find it during his visits to the Swamp, principally, I believe, because he did not happen to search for it in the right locality; he did not include it, even hypothetically, in his Erie list (*Birds of Erie and Presque Isle*, 1904, 586).

During our six years of field work five streams and their tributaries were found to be the haunts of these vivacious birds. These were

Randolph's Run, Jack's Run, Klink's Run, a tributary to French Creek, the name of which we have not ascertained, and a small stream near Meadville Junction. All these were swift flowing, well shaded rivulets, the waters of which slipped along over ledges or shining gravel bottoms.

On May 2, 1922, near Hartstown, we first saw a mated pair, which had almost certainly come at an earlier date. On May 11 two more pairs were located. On May 12, a female bird, with a great mass of mud and leaves in her bill led me directly to her nest, which was beautifully built under a little ridge of soil and moss, and sheltered by rootlets and an overhanging canopy of hemlock and ferns. She was so intent upon finishing her nest that I almost stepped upon her before she burst out with an explosive flutter of wings. On May 20 this nest held five fresh, beautifully wreathed eggs. Leading up the bank to the structure was a neat and compact avenue of dry leaves upon which the birds walked. On May 24 a nest with six young about four days old was found high on a bank along Jack's Run, not far from Hartstown. They left the nest on May 31. The parents were very solicitous for their welfare and dragged themselves about even through the water in trying to attract my attention.

On May 17, 1925, a pair were found not far from Meadville Junction Pond, in an entirely new section. Doubtless every suitable stream furnishes a nesting-ground for one or more pairs. Mr. Kirkpatrick found a nest with a set of incubated eggs near Meadville on June 2, 1906.

We have no fall records. Birds seen at Hartstown during latter August, 1925, were obviously local summer residents.

Oporornis formosus (Wilson). KENTUCKY WARBLER (677).

Mr. Kirkpatrick writes me as follows: "Dr. Breed, a former instructor of Biology in Allegheny College, told me that he saw a bird, which he thought was of this species, in the spring of 1910". While we have no records at hand, and while Mr. Todd did not include the species, even hypothetically, in his Erie list (*Birds of Erie and Presque Isle*, 1904, 586) it is probably only a matter of time until this southern form, which now inhabits much of southwestern Pennsylvania, will have extended its range to include this region.

215. **Oporornis agilis** (Wilson). CONNECTICUT WARBLER (678).

A very rare migrant, for which we have but two records. An adult male was seen on May 18, 1922, at Crystal Lake. On Septem-

ber 11, 1925, an immature bird (with noticeable white eye-ring) was observed at Lower Lake. What I believe to have been another immature bird was shot on September 12, 1925, but it could not be found among the weeds, where it fell. Mr. Todd recorded it several times at Erie (*Birds of Erie and Presque Isle*, 1904, 586).

216. **Oporornis philadelphia** (Wilson). MOURNING WARBLER (679).

A rare migrant about equally common in both spring and fall. In spring I noted it twice: May 16, 1922, Crystal Lake; and May 17, 1925, Shermansville. In the fall of 1925 the first one was seen on September 10, low among the jewel-weed (*Impatiens*) about two miles north of Hartstown. On September 11 three were seen, one of which was a handsome adult male. On September 12 an immature male was secured. Mr. Ralph Simpson has found this species as a more or less common summer resident near Warren, Warren County, and it seems probable that it may occasionally be found in summer in the present region.

217. **Geothlypis trichas trichas** (Linnæus).

MARYLAND YELLOW-THROAT (681).

An abundant migrant and summer resident, restricted to the marshy sections of the region during the nesting season, and particularly abundant among the cat-tails, high grass, and rank weeds of Pymatuning. May 3 was the date of its vernal appearance at Hartstown, in 1922. Two males were seen at this time. Thereafter it became increasingly abundant, and a nearly finished nest was found on May 23, situated in a dense clump of grass so hidden by bushes and weeds that it is remarkable that it was ever discovered without the flushing of the female bird. On May 25 and 26 three nests with four eggs each were found and collected. These structures were built among the dead cat-tails, and they were very deep and neatly lined with fine dry grasses. A nest ready for eggs was found on May 16, 1925, near Shermansville. A nest containing three Yellow-throat eggs and one of the Cowbird, found on June 17, 1923, may have been a second set for the season. This nest was built into a small clump of grass, and was most artfully hidden by the wide leaves of a marsh marigold. Mr. Kirkpatrick found a nest with four eggs near Meadville on May 18, 1880.

During our fall visit in 1925 Yellow-throats were seen commonly

every day, and I could not detect what I thought to be an influx of migrating individuals from the north. Adult males in full plumage were seen on August 31 and September 11, near Crystal Lake. Mr. Bergstrom recorded it as late as October 1, at Shermansville.

218. *Icteria virens virens* (Linnæus).

YELLOW-BREASTED CHAT (683).

A regular but uncommon summer resident found only in the brush-grown uplands, and, so far as we have been able to determine, nesting at only four points in the region. Mr. Kirkpatrick's first date of vernal appearance for Meadville is May 15, 1909. Although it may easily have arrived at an earlier date and escaped detection, none was noted before May 16 during 1922. On May 28 the nest of this pair was found in a clump of black raspberry-bushes a mile west of Hartstown. It contained one egg. On June 1 the nest with a set of five fresh eggs was collected. Other records are: May 31, 1923, a pair seen near Hartstown; June 1, 1924, an unfinished nest, found about two miles northwest of Hartstown; June 30, 1927, nesting pairs noted near Atlantic and Adamsville. Mr. Kirkpatrick found a pair and their nest and four eggs near Meadville on June 10, 1895.

219. *Wilsonia citrina* (Boddaert). HOODED WARBLER (684).

A common migrant and summer resident found in the deciduous woods particularly about beech trees, and only sparingly in the wooded Swamp. A male shot May 10, 1922, near Hartstown, was the first one recorded that season. On May 26 three mated pairs were observed, and on May 29, due to Mr. Thomas's vigilance a beautiful nest with four eggs (and one of the Cowbird) were found at the surprising height of eighteen feet from the ground in a slender upright shoot growing out from the trunk of a large beech tree. The eggs were fresh. On May 30, 1923, a partly completed nest was found in a much lower position, in a beech sapling only about five feet from the ground. Mr. Kirkpatrick found a nest with small young near Meadville on July 6, 1895.

An adult male, secured on August 22, 1925, near Shermansville, was in very poor plumage, its tail having no fully grown feathers whatever. On August 24 two immature birds were seen. On September 2 a handsome adult male was secured, not far from Lower Lake. The actual migrants did not arrive until September 11, I believe,

since on that date several birds were seen in company with the Black-throated Blue Warblers and others which had just come. It was not recorded after September 14.

220. ***Wilsonia pusilla pusilla*** (Wilson). WILSON'S WARBLER (685).

A migrant, rare in spring and fairly common as a rule in the fall. Our only vernal records are as follows: May 12, 1926, Shermansville (Bergstrom); May 15, 1922, male secured north of Hartstown (Sutton); May 17, 1923, male and female seen, Crystal Lake (Sutton); May 23, 1922, male seen, Lower Lake (Sutton). Mr. Kirkpatrick took a male near Meadville on May 15, 1908.

On August 28, 1925, an immature male was secured at Crystal Lake. The moult was complete. On September 1 two were seen about a mile north of Hartstown. They were very restless and wagged their tails a great deal. This pair (I believe the same birds) were noted for several days. On September 7 several were seen, and from then on to September 15 were quite common. On September 22 the last one was seen.

221. ***Wilsonia canadensis*** (Linnæus). CANADIAN WARBLER (686).

A fairly common migrant, which nests regularly but not abundantly at Pymatuning in the wilder, dense, upgrown portion of the Swamps. Mr. Kirkpatrick's earliest dates of spring appearance for Meadville are: May 11, 1892; May 12, 1906; May 15, 1908. From May 13 to 23, 1922, we found them abundant, and birds seen thereafter until June 4 were mated. A male was collected May 17, 1923, near Lower Lake. A pair seen at Cherry Island, May 23, 1922, probably had a nest. Mr. Todd collected a male not far from Hartstown on June 16, 1898, and saw others. Four mated pairs were found in the Swamp three miles north of Hartstown on June 30, 1927.

An immature bird was seen on August 21, 1925, near Hartstown. The species was noted as late as September 12, on which date two adults were seen. It is apparently rare as a fall migrant.

222. ***Setophaga ruticilla*** (Linnæus). REDSTART (687).

Abundant as a migrant throughout the region; common as a summer resident only in the deciduous woods of the uplands, principally among the slender saplings of birch, maple, aspen, and beech. From May 3 to 20, 1922, it was very abundant at Pymatuning. On May 20 a partly completed nest was found about three miles north of

Hartstown. The male parent was collected. His plumage was odd; the wings and tail were banded with pale, washed-out yellow, rather duller than that of the female; and the black feathers of the head and breast were just commencing to appear. It is regrettable that the specimen could not be saved.

During 1922, 1923, and 1924, twenty-seven nests were found. Unfinished nests were found on May 20, May 29, and May 30; several nests just ready for eggs were found on May 30, 31, and June 1. Full sets of fresh eggs were found on May 29, May 31, and June 1. Nests with incomplete sets were found between May 28 and June 1. Incubated sets were found on May 29 and June 3. Young birds just hatched were found on June 1, 3, 15, and 17. From this array of data it will be seen at once that there is great latitude in the nesting dates of the Redstart. However, as a rule nests were finished by May 25, held full sets by June 1, and contained young by June 15.

Nests were always beautifully constructed, saddled deeply into the crotch of a slender trunk, or built upon a dead protruding limb like a knot. The walls of some of the nests were so thin that when removed from their crotch great holes appeared in the sides where no lining had been placed. In one case a nest had been built over the abandoned structure of a previous year. Only one nest was over twenty feet from the ground. Most of them were from six to twelve feet up. The females were often quite tame and one allowed me to stroke her back. As a rule they fluttered off slowly, however, with vivid wings and tail spread widely. Sets of eggs usually numbered four; but four nests with five eggs or young were found. No Cowbird eggs were found in any of the nests.

In 1925 Redstarts were seen commonly from August 21 to September 18. The height of the migration apparently occurred on September 11, on which date many species of warblers were abundant.

223. *Anthus spinoletta rubescens* (Tunstall).

AMERICAN PIPIT (697).

A rather uncommon, although perhaps regular migrant, which sometimes occurs in large flocks. It is apparently commoner in the fall than in the spring. On September 20, 1908 (our earliest date of fall appearance), Mr. Kirkpatrick saw a flock of five in an open field bordering French Creek two miles south of Meadville. On October 21, 1895, Mr. Kirkpatrick saw a large flock, numbering possibly thirty

individuals, in almost the same spot, and collected one male specimen. Mr. Bergstrom observed a flock of one hundred or more individuals on November 6, 1926, in an open portion of the Swamp not far west of Shermansville. He collected one male specimen in perfect plumage.

We have no spring records at present.

224. *Dumetella carolinensis* (Linnæus). CATBIRD (704).

Mr. Todd found the Catbird numerous in the Swamp during his early visits in 1895-98. We found it almost excessively abundant—by far the commonest bird of the region, broadly speaking, far exceeding the Robin in numbers, and, strangely enough, most common in the wildest, wettest parts of the Swamp. It sometimes arrives in late April: April 25, 1896, Meadville (Kirkpatrick); April 28, 1922, Shermansville (Sutton); April 29, 1925, Conneaut Lake (Langdon); but it usually comes in early May: May 4, 1902; May 5, 1906; May 9, 1908, Meadville (Kirkpatrick).

On May 4, 1922, it was abundant everywhere at Pymatuning; most of the birds were mated, and one female was building a nest. During the several months of our field-work one hundred and ninety nests were located literally in all portions of the region save the dense woods, from the syringa bushes about the farm-houses to the wildest rose and willow clumps in the Swamp. On May 6, 1922, four pairs were observed at work on their nests near Hartstown. On May 20 and 22 nests with incomplete sets of eggs were found. From May 23 onward complete sets were found, numbering usually four, often three, and in five cases, five eggs. Two nests with four eggs were collected west of Hartstown on May 26. No nest with young was found before May 28. On two occasions Black Snakes were known to destroy the eggs of this species.

In 1925 Catbirds were numerous from August 21 to September 30. On September 2 a great many immature birds were noted. Mr. First noted one at Meadville on October 3, 1907.

225. *Toxostoma rufa rufa* (Linnæus). BROWN THRASHER (705).

Rather rare and apparently irregular as a summer resident in Pymatuning Swamp; common in the outlying districts. Mr. Kirkpatrick has recorded it as early as April 18, 1898, though it usually comes a little later in this latitude: April 28, 1908, Meadville (Kirk-

patrick); April 29, 1922, Lower Lake (Sutton). On May 12, 1925, Mr. Langdon saw a pair near Conneaut Lake. We found a pair with a nest about two miles west of Hartstown on June 2, 1922; and a nest with fully fledged young, and a young bird just out of the nest on June 1, 1924, at the edge of the Swamp just south of Shermansville. It was not known to nest in the Swamp during the period of our field-work; Mr. Todd, however, recorded a pair in the brush about Crystal Lake on June 25, 1895. From May 15 to 17, 1925, several of the birds were observed in the brushy pastures and along the thorny roadsides near Conneaut Lake and its outlet. Mr. Kirkpatrick has found nests near Meadville on June 16, 1916, June 20, 1915, and June 26, 1897.

From August 24 to October 1, 1925, Brown Thrashers were seen and heard almost daily at Crystal Lake. Apparently the moult was finished by about September 12. Mr. Hunter saw one at Hartstown on October 10, 1923.

***Thryothorus ludovicianus ludovicianus* (Latham). CAROLINA WREN (718).**

Mr. Samuel E. Bacon recorded this species at Erie in April, 1898 (Todd, *Birds of Erie and Presque Isle*, 1904, 588). This southern species will doubtless extend its range to include the present region as have the Cardinal, Tufted Titmouse, Red-bellied Woodpecker, etc.

226. *Troglodytes aëdon aëdon* Vieillot. HOUSE WREN (721).

A common migrant and summer resident, far more often seen in the wooded Swamp than in the towns or adjacent farm-yards. Mr. First's earliest dates of arrival for Meadville are: April 18, 1913, and April 25, 1914. Residents of Hartstown said that it came on April 24 in 1922. On April 28 and 29 three were noted in full song. On May 3 a partly completed nest was found in a deserted hole of the Downy Woodpecker north of Hartstown. On May 15 two "dummy" nests were located, and on May 17 an incomplete set of three eggs was noted. A nest just ready for eggs, found on May 22 was beautifully lined with feathers of the Blue Jay, Flicker, and Screech Owl. On this same date two nests, each with six eggs, were found at Baker's Farm, west of Hartstown. On May 24 nests with six and seven eggs were taken, one from a natural cavity in a stump, only a short distance above the surface of the water, and one from a huge nest built above the window sill at the humus plant north of Hartstown. Other dates for nests and eggs are as follows: May 24, 1922, nest and seven fresh eggs; June 15, 1923, nest and six partly incubated eggs. Mr.

Kirkpatrick found a nest with three eggs and two young on June 9, 1900, at Meadville.

Mr. Todd did not, apparently, observe this species in the Swamp during his visits in early years. There may be good reason for this, since the Swamp has unquestionably become thinner during late years and many of the trees have died, thus furnishing nesting cavities for such birds as the House Wrens.

On August 21, 1925, an adult male in the moult was shot. It was singing a very peculiar, squeaky song. It was seen along the tracks near Hartstown. House Wrens were seen commonly throughout September. Mr. Bergstrom saw one on October 4 at Shermansville, during 1926.

227. *Nannus troglodytes hiemalis* (Vieillot). WINTER WREN (722).

A fairly common migrant, commonest during April and early May, and in October; rare and rather irregular during winter. Our only winter record is for February 18, 1925, when one bird was seen in the dense brush south of Lower Lake. In spring it often appears very early. Mr. Kirkpatrick took one near Meadville on March 30, 1908. He, however, found them most abundant a little later: April 10, 1890; May 9, 1908. Mr. First's only spring record for Meadville is May 17, 1914. Two birds seen May 4, 1922, west of Linesville, were apparently mated, and the male was singing brilliantly.

In 1925 the first autumnal migrant appeared on September 22. On this date an immature male was taken near Lower Lake. Mr. First's fall records for Meadville are: October 3, 1914 and November 3, 1913.

228. *Cistothorus stellaris* (Naumann).

SHORT-BILLED MARSH WREN (724).

A rather rare and very local migrant and summer resident at Pymatuning Swamp and Conneaut Lake, which probably occurs in many parts of northwestern Pennsylvania, where it is not observed because of its retiring habits. If the migratory movements of this species are to be known, one must be at its nesting grounds constantly during spring and late summer, for the small creatures slip in and out very quietly. Thus, although it doubtless nested in the Swamp during 1922, it was not until May 31, 1923, that we found it in a portion of the open, grassy marsh west of Shermansville. Here a pair were observed for some time. They were both remarkably tame and allow-

ed us to approach to within four or five feet. In the center of their grassy habitat were two slender dead stubs upon which they were often seen, and where the male customarily sang his ridiculously *clacketty* songs. One song frequently heard might be written "Chip, chip, chi-i-i-i-i-i". When closely approached, they seemed hesitant to leave their perches, and often leaned far over toward the ground before dropping to it or buzzing away to trail into the grass, whence it was often very difficult to frighten them.

On June 16, upon returning to the spot where the birds had first been seen, we immediately found them. When we watched quietly they were nowhere to be seen; but once flushed, they went to the upright stubs and started singing and scolding. On this date a dummy nest was found built into the top of a tussock of grass and only about six inches from the ground. It was globular with a very small, almost completely hidden, entrance at the side. Two other dummy nests were subsequently found, but the nest with eggs was not located. Later in the day another pair of birds were found across the corduroy-road only a few hundred yards away. Songs given by both male birds on June 18 reminded me strongly of the insect-like performance of the Dickcissel, particularly the latter portion of the song. This song might be written "Dick, putt, jik, plick, chick-chick-chick."

On May 16, 1925, after walking through the grass, where the birds had formerly nested, there was no sign of them. In re-traversing the section, however, I literally kicked them from the grass, and once they were discovered, they were everywhere in evidence, this year four pairs of them. No nests were found, however.

It was noticeable that the Short-billed and Long-billed Marsh Wrens were nowhere found together during summer. At Conneaut Lake the Short-billed Marsh Wrens lived only in a grassy meadow several hundred yards northwest of the cat-tail stretches, which the Long-billed Marsh Wrens frequented. The Short-billed Marsh Wrens seemed to be more constant in their occurrence. Long-billed Marsh Wrens were known to be entirely absent at Pymatuning during the spring of 1922, for they were constantly searched for and not found.

In the fall of 1925 considerable time was spent in searching for this species. It was found in a wide savanna southeast of Hartstown and rather commonly at Conneaut Marsh about six miles south of Conneaut Lake. On August 27 four were seen, and one immature male in the moult was secured. On September 3 and 4 several were seen

near Hartstown. On September 19 about eight were seen and two secured, one of which was an adult in the moult and in very poor feather, and the other an immature or juvenal in perfect feather. On September 22 several were seen about a mile south of Lower Lake and two old nests were found in the sedges.

According to Warren (*Birds of Pennsylvania*, 1890, 312) Mr. Kirkpatrick regarded the Short-billed Marsh Wren as a regular summer resident in suitable places throughout Crawford County. He has no definite records, however.

229. **Telmatodytes palustris palustris** (Wilson).

LONG-BILLED MARSH WREN (725).

A locally and sporadically abundant migrant and summer resident, known to occur chiefly in the cat-tail marshes near Hartstown, and at the northern and southern ends of Conneaut Lake. Mr. Langdon recorded it at the Lake on May 12 in 1925. Mr. Kirkpatrick's earliest Meadville record is May 16, 1892.

We did not find it at Pymatuning until May 30, 1924, although we looked for it carefully during the two preceding seasons. On May 30 at least six pairs were seen. On the following day no less than twenty-seven nests were found, most of which were dummies, but some of them were probably ready for eggs. These nests were without exception built into the tops of cat-tail clumps; they were beautifully constructed, and firmly attached, the leaves of the supporting plants being thoroughly wound into the walls of the nests. Cat-tail down was often used as a lining. Nests were usually twelve inches or more above the water; some were placed in the higher stalks about four feet above the water.

One bird was closely observed as it worked at a nest. So far as I could see only *wet* cat-tail leaves were used, and some of the inner material was not only very wet but partly decayed. Such material was very pliable and no doubt permitted the artisans to work it into the structure more easily. Moreover, when this material became dry it was obviously very light and warm.

On June 30, 1927, a nest with five newly hatched young was found three miles north of Hartstown. On July 1, 1897, Mr. Kirkpatrick found fifteen nests of the Long-billed Marsh Wren in a cat-tail swamp on the west side of Conneaut Lake below Conneaut Lake Park. Fourteen of these were probably dummies, for one egg was found in

the other. But one pair of birds was found in the vicinity. The nests were all within a radius of about ten feet.

In August 1925 about twenty birds were seen near Geneva on several days. On September 4 a juvenal male was collected at Hartstown. On September 19 an adult was secured near Atlantic. They were still common on September 23 and 24 and doubtless remained a week longer. Mr. Bergstrom saw one near Shermansville on October 2.

Mr. Todd did not find the Long-billed Marsh Wren at Pymatuning in his early visits. This may have been partly due to his not wading through the cat-tail marshes which the species frequents; but it seems probable to me that the sturdy growth now present near Hartstown is a recent development, and that in former years the Wrens did not find the locality suitable to their needs. It is barely possible that there never had been any Long-billed Marsh Wrens at the Swamp prior to 1924, during which year the migrating birds may for the first time have found a favorable ecological association in which to nest.

230. *Certhia familiaris americana* Bonaparte.

BROWN CREEPER (726).

Common as a migrant in the early and middle part of spring and in the fall until late November; regular, but not often abundant, as a winter resident; and rare as a summer resident. It is likely that in the past it nested more frequently in the Swamp.

Mr. Sennett regarded it as a summer resident in the higher portions of Erie County in his time (Warren, *Birds of Pennsylvania*, 1890,² 314). In this region, however, it is not found at high elevations, but amidst ecological surroundings similar to those in its range farther north; the greatest difference being, perhaps, that of average temperature. Mr. Todd met a family party, the young well developed and able to roam about with their parents, on June 25, 1895, between Linesville and Hartstown. Two of these were secured as specimens.

Since this species is found throughout the year, it is difficult to distinguish migrant and resident individuals. However, many were seen from April 27, 1922, onward. By May 3 most of them were mated and males were singing. On May 18 a nesting pair were observed for some time south of Linesville, but the nest was evidently placed in such a remote and inaccessible portion of the Swamp and the birds moved so much more rapidly than I could successfully follow that it was not located. Two old nests were found on this date, however,

typically built under strips of bark, respectively at eighteen and twenty-five feet from the ground. One of these nests was again examined on May 27, and the lining appeared to be so fresh that I considered it possible that the birds were using the nest for a second season; but no birds came near while I waited. On May 16, 1925, a nesting pair were observed near Linesville.

On August 21, 1925, a pair and their fully fledged young were seen about two miles north of Hartstown. I finally secured one of the young birds on August 31. Its moult was not quite complete. On September 1 and 16 one bird was seen. On September 22, however, Brown Creepers were abundant and I believe this date marks the first of the autumnal migration. That it remains through the winter is shown by the following records: February 11, 1927 and February 19, 1925, Lower Lake (Sutton); February 27, 1909, Meadville (Kirkpatrick).

The sweet but not very noticeable song was usually given while the bird perched on the tree trunk, its head held high and out from the body. One song I syllablized as "dee dwee, did-i-ly, dee dwee". While the song was heard chiefly during the mating and nesting season, it was also heard at other times. A bird which we followed about near Lower Lake on February 19, 1925, sang beautifully a dozen times or more.

231. *Sitta carolinensis cookei* Oberholser.

WHITE-BREADED NUTHATCH (727).

A common permanent resident occurring in the towns and upland woods as well as in the Swamp. From February 17 to 20, 1925, numbers of White-breasted Nuthatches were noted among the roving flocks of winter birds about Crystal and Lower Lakes.

Mr. Langdon observed a pair at their nest high in an oak near Conneaut Lake on April 27, 1925. On April 28, 1922, I watched a pair for about an hour carrying nesting material to a large cavity high in a swamp maple about one mile north of Hartstown. It is my belief that this nest held a partly incubated set of five eggs at the time, despite the fact that the birds were apparently only building, for on May 8, after an extremely difficult climb and much labor in opening the cavity, the eggs were found to be at the point of hatching. The cavity was very warmly and thickly lined with moss, vegetable fibre, some feathers, and a great deal of rabbit fur. One could only

wonder where they found so much fur; there must have been a peck or more of it.

A nest with six young was found on May 16, 1922, about forty feet up in a tulip-tree, west of Shermansville. On June 1, 1924, two nests with young were found near Atlantic. These birds were almost ready to leave the nest. A nest found on May 17, 1925, near Meadville Junction Pond held eight rather small young. This nest was also built in a natural cavity about thirty feet up in a black oak. The parent birds were very combative and flew about calling anxiously. A pair seen June 25, 1895, by Mr. Todd were accompanied by their fully fledged young.

One adult male secured on August 29, 1925, had not yet fully completed the post-nuptial moult.

232. *Sitta canadensis* Linnæus. RED-BREASTED NUTHATCH (728).

Although Mr. Sennett is said to have regarded this species as a regular summer resident in parts of Crawford County (Warren, *Birds of Pennsylvania*, 1890, 316) we have not found it at all common or regular at Pymatuning. Mr. Todd did not find it in his early visits, and our own records tend to reveal it chiefly as a rather rare migrant and irregularly common winter resident. Mr. First saw one near Meadville on April 29, 1914. We saw one on May 2, 1922, near Shermansville. Mr. Kirkpatrick saw a male and female on May 5, 1880, near Meadville. During 1922 we saw it rather commonly until May 17. On July 2, 1927, we located a nesting pair about a mile south of Linesville in a rather dense hemlock woods.

On February 19, 20 and 21, 1925, numbers were seen all through the Swamp. They were commoner than any other species save the Pine Siskin. They were observed chiefly in the coniferous growths, although several were seen in the low alders fairly near the ground. A male in excellent plumage was secured on February 20.

We have but one fall record: September 24, 1925, Lower Lake (Sutton).

233. *Bæolophus bicolor* (Linnæus). TUFTED TITMOUSE (731).

A fairly common permanent resident, which only during recent years has extended its range to include this region. Mr. Todd did not record it during his early visits to Pymatuning. Mr. Kirkpatrick saw one at Meadville on December 23, 1890. Thereafter none was

seen until 1908, during which year Mr. Kirkpatrick saw individuals on September 26 and December 22. In 1909 he saw one on February 27. Thus far it will be noted that virtually all records have been made in the winter. Mr. Todd regarded it only as a winter straggler at Erie (*Birds of Erie and Presque Isle*, 1904, 591). In the spring of 1909, however, Mr. Kirkpatrick saw two at Meadville on May 8, and later on May 12. He also recorded it on May 1, 1911.

When we first came to the Swamp we saw no Tufted Titmice (April, 1922). On May 7, 1922, however, one was seen in a beech woods near Stewart's Corners. It was observed for some time and evidently was without a mate. On May 16, 1923, a female was found building a nest high in a dead stub in the deserted hole of a Pileated Woodpecker about two miles northwest of Hartstown. She brought to it great mouthfuls of dead leaves. I could not reach the nest without endangering the entire stump. On May 31 this pair were seen again, and the male was seen to bring food to the female in the nest. During 1924 and 1925 Tits became commoner everywhere. A nesting pair were seen on June 1, 1924, near Shermansville. A flock of ten were seen west of Shermansville on February 20, 1925. Several were noted near Hartstown on February 11, 1927. In the fall of 1925 about forty were seen about Crystal and Lower Lakes, from ten to thirty birds being seen every day. The gradual increase of this species furnishes an excellent example of the invasion of this area by southern forms, as the more northern forms recede and disappear.

234. ***Penthestes atricapillus atricapillus*** (Linnæus).

CHICKADEE (735).

An abundant permanent resident, apparently more common in winter than in summer, and particularly common in the wooded swamp, where it seems to be partial to the aspens and slender black birches.

Nesting operations begin early. Cavities are dug from the middle of April on. In every case noted during our field-work but one, the cavities were made by the parent birds, and were not natural cavities or the deserted nests of woodpeckers. Mr. Kirkpatrick saw birds digging their nest on April 23, 1908. I secured a pair of birds near Crystal Lake on April 29, 1922; the female was laying eggs at the time. Her belly was bare of feathers and a perfectly formed but unspotted egg was found in her oviduct. An unfinished nest was found on May

3, 1922. By May 13 two nests which had been started late were ready for eggs. On May 17, 1923, a nest and eight eggs were collected by Mr. Todd about three miles north of Hartstown. On the same date I found two nests with two and three eggs respectively. During 1922 the season must have been earlier than in 1923, for nests with seven and eight half-grown young were found on May 20 and 21, whereas in 1923 young at the same stage of development were not found until a week or more later.

During our field-work twenty-eight nests were found. Three of these were in small black birch stubs; one (found by Mr. Todd) was in a tamarack; and all the rest were in slender dead aspens. In digging the cavity in these aspens an irregular entrance hole was made, elliptical in shape and with uneven edges. Cavities were usually about eight inches deep, and the decayed wood was removed to the very bark so that one had but to pick away a little of the outer covering of the tree to see directly into the nest. Nests ranged from three and one-half to twelve feet from the ground. The largest set of eggs (nine) was found by Dr. Jennings on May 30, 1924, near Lower Lake. These eggs were heavily incubated. Mr. Todd found young birds roaming about with their parents on June 25, 1895.

From May 15 on, both in 1922 and 1923, adult birds were observed laboriously digging out additional cavities in nearby trees, either for a second brood of young, or for roosting quarters. In picking at these cavities the birds often hung upside down and delivered very muscular blows. They usually carried the chips some distance away before dropping them.

During the fall of 1925 Chickadees were seen daily. They were often pursued by Ruby-throated Hummingbirds.

235. *Regulus regulus satrapa* Lichtenstein.

GOLDEN-CROWNED KINGLET (748).

A migrant irregularly common in early spring and latter fall; abundant as a winter resident, at which time it is one of the characteristic birds of the Swamp. Mr. Kirkpatrick's earliest dates of fall appearance are as follows: October 22, 1910, Meadville; October 23, 1911, Cochranon; October 25, 1908, French Creek. On December 25, 1890, he saw numbers of them at Meadville. It remains until latter March and early April, Mr. Kirkpatrick's latest records being March

30, 1908, and April 21, 1908 (Meadville). Mr. Langdon saw about forty birds on March 18, 1927, near Conneaut Lake.

By the time of our first visit (April 27, 1922) most of the Golden-crowns had departed for the north and but two were seen, one of which was singing. We saw one bird on April 29, 1922. During February, 1925, they were extremely common about the hemlocks and tamaracks near Crystal and Lower Lakes.

236. *Corthylio calendula calendula* (Linnæus).

RUBY-CROWNED KINGLET (749).

A common transient visitant about equally common in spring and fall. Mr. First has recorded it at Meadville as early as April 9, 1913. Usually, however, it comes later: April 16, 1908, Meadville (Kirkpatrick); April 19, 1914, Meadville (First); April 23, 1926, male secured, Conneaut Lake (Langdon). Several were seen and heard in full song on April 28, 1922, indicating that it had probably been about for several days during that season. On April 29, 1922, a female was secured. On April 30 it was very abundant and from then on it was seen until May 13. Mr. Kirkpatrick has not noted it at Meadville later than May 9, 1908. Mr. Langdon recorded it on May 15, 1926, at Conneaut Lake.

In the fall it arrives in latter September: September 22, 1925, Lower Lake (Sutton). It remains about a month: October 1, 1911, Meadville (Kirkpatrick); October 10, 1914, and October 26, 1915, Meadville (First).

237. *Poliptila cærulea cærulea* (Linnæus).

BLUE-GRAY GNATCATCHER (751).

While Crawford County is doubtless north of the present normal breeding-range of this species, it is known to have nested in the present region once, and its occurrence here is of great interest as evidence of the outspreading of the fauna of the Carolinian Zone as the Canadian fauna recedes.

Mr. Kirkpatrick noted it first in the region of Meadville on July 27, 1897. On this date four immature birds were seen. One of these was secured. He saw it again on April 20, 1908, when several adults were noted. Mr. Kirkpatrick thinks these birds had just arrived from the south. This observer found a nesting pair near Meadville on May 23, 1908. The nest was being built at the time. After close observa-

tion for some weeks the nest and five eggs were collected on July 4. I examined the beautiful nest, which is at present in Mr. Kirkpatrick's collection.

We saw one near Crystal Lake on May 20, 1922. It remained about for four days and was not seen thereafter. It called loudly nearly all the time and was apparently alone.

238. *Hylocichla mustelina* (Gmelin). WOOD THRUSH (755).

A common migrant and summer resident in the deep woodlands of the higher country, but not nearly so common as the Wilson's Thrush in the Swamp. Mr. Todd noted the same relative abundance of these two species in 1895 and 1898. Mr. First noted its vernal appearance on April 26, 1914, at Meadville. In 1922 it arrived at Hartstown on May 2. On May 11 it was abundant and on May 13 an unfinished nest was found near Crystal Lake. On May 18 several nests were found. On May 20 and 29 nests with four eggs were collected from horizontal branches in the low trees about Dollar Lake. Six nests in all were found. All of these were over eight feet from the ground.

Probably this species occasionally rears a second brood. A nest found on August 22, 1925, had young just ready to leave. An adult taken near Shermansville on September 14, was still in the moult. The species was last noted at Lower Lake on September 19.

239. *Hylocichla fuscescens fuscescens* (Stephens).
WILSON'S THRUSH (756).

An abundant migrant and summer resident, largely restricted to the Swamp proper, but occurring in suitably damp woodlands everywhere in the region. Mr. Todd found it abundant in former years: June 25, 1895, June 16, 1897, June 16, 1898. He regarded it as much commoner than the Wood Thrush.

Mr. Langdon secured a male specimen on April 29, 1925. This must be considered our earliest spring record, although both Mr. Bergstrom and Mr. Langdon feel certain that it came as early as April 11 in 1925. In 1922 I am positive it did not arrive before May 3. Two specimens were secured on this date from the large numbers which suddenly appeared. Both birds were extremely thin, and all the birds were seemingly tired and listless. A specimen secured on May 15, 1923, was in much better condition. By May 6, 1922, it was abundant everywhere and singing. On May 25 a partly finished

nest was found on a fallen, decayed, and overgrown log, which was floating in the water. This nest, with four eggs, was collected on May 30. The female flushed closely and quietly. The nest was beautifully constructed of the stems of weeds and old leaves, and the cup was deep and narrow. On June 15, 1923, a female was seen feeding fairly well developed young near Lower Lake. On the following day a nest with three fresh eggs was found by Mr. Gustav Link, Jr., in a low sprawling hemlock about four miles north of Hartstown. Perhaps this was a second set for the season.

During the fall of 1925 we found it very shy and retiring. On September 7 an adult male was secured at Dollar Lake. On September 22 but one was seen. Mr. First recorded one at Meadville as late as October 12, 1913.

240. *Hylocichla minima aliciae* (Baird). GRAY-CHEEKED THRUSH (757).

A fairly common migrant, never so abundant, or at least so often certainly identified, as the Olive-backed Thrush, but present at about the same time and in about the same places as that species. Our spring records are as follows: May 14, 1922, two seen, Crystal Lake (Sutton); May 16, 1922, three seen, Hartstown (Sutton); May 17 and 22, 1926, Conneaut Lake (Langdon); May 17, 1922, male secured, Dollar Lake (Thomas); May 18, 1925, Greenville, Mercer County (Seiple); May 20, 1922, Shermansville (Sutton).

On September 8, 11, 12, 14, and 22, 1925, one or two were seen on each date near Crystal and Lower Lakes.

241. *Hylocichla ustulata swainsoni* (Tschudi).

OLIVE-BACKED THRUSH (758a).

A common transient visitant, apparently more abundant in the fall than in the spring, and heard singing much more frequently than the preceding species. On May 15, 1922, the first one seen, a male, was secured at Crystal Lake. From then on to May 27 they were daily observed in the vicinity of Hartstown and Shermansville; on May 17, 1923, a female specimen was taken at Lower Lake, and from May 14 to 17, 1925, they were abundant about Shermansville and Linesville. One seen near Stewart's Corners on June 1, 1924, furnishes our latest spring record. This individual was in full song.

In the fall it appeared at Dollar Lake on September 7, 1925. It

was common until the end of September. An immature female was taken at Crystal Lake on September 16.

242. *Hylocichla guttata faxoni* Bangs and Penard.

HERMIT THRUSH (759b).

A common migrant in early spring and latter fall appearing in April: April 10, 1909, Meadville (First); April 11, 1925, Conneaut Lake (Langdon); April 16, 1914, Meadville (Kirkpatrick); April 17, 1926, Shermansville (Bergstrom); and remaining until late April or early May: April 19, 1925, Hartstown (Langdon); May 2, 1922, Crystal Lake (Sutton); May 2, 10 and 17, 1926, Conneaut Lake (Langdon). Two were seen by us at Lower Lake, on April 28, 1922, and a female was taken on April 29.

Mr. First noted its appearance in the fall at Meadville on the following dates: October 17, 1909; October 22, 1910; October 30, 1911. Mr Carl Burch and Mr. Kirkpatrick of Meadville have known it to remain through part of December, sometimes almost until Christmas, particularly during milder seasons.

243. *Turdus migratorius migratorius* Linnæus. ROBIN (761).

An ubiquitous migrant and summer resident, surprisingly common in the wilder portions of the Swamp; occasionally a winter resident. On February 18, 1925, at least forty were seen in the apple-trees of a farm-yard near Hartstown, eating the frozen fruit. When frightened, this band of winter residents went to the Swamp, where they had several times previously been noted. On February 19, 1925, two were seen near Shermansville; these may have been arrivals from the south, but Mr. Langdon thinks that the spring migration did not commence until March 10, when several male birds arrived in different parts of the region. Mr. Kirkpatrick has the following winter records for Meadville: December 14, 1908; January 5, 1882; January 24, 1898.

In 1922 they were numerous on April 28, when we arrived. Many nests were found almost at once. The following dates are average: May 5, 1922, nest and four eggs collected, Hartstown (Sutton); May 13, 1922, nest ready for eggs found near Shermansville (Thomas); May 14, 1922, four young ready to leave nest, Lower Lake (Hutchens); May 22, 1923, young almost as large as adults, flying about with parents, Linesville (Sutton). During our visit in 1925 numbers of

very low-built nests were found. Two were built on dead stubs in the Swamp near Meadville Junction Pond, very near the ground, or the surface of the water. Mr. Kirkpatrick found a nest at Meadville on the remarkably late date of December 8, 1889. This nest held two fresh eggs.

By early July flocks of the young birds assembled nightly in their chosen roosting places. From August 21 to September 30 great flocks were seen everywhere throughout the Swamp; they were feeding upon wild cherries.

244. *Sialia sialis sialis* (Linnæus). BLUEBIRD (766).

A common migrant and summer resident found in the deep Swamp as well as in the outlying farming districts; occasional as a winter resident, but not found in large flocks during the cold season. In 1925 wintering individuals were seen on February 5 by Mr. Hutchens. On February 20 we saw two flying slowly over the tamaracks, calling softly. Mr. Kirkpatrick has the following winter records for Meadville: January 24, 1888; February 24, 1891; February 26, 1894; February 29, 1892.

Mr. Bergstrom thinks that the birds he saw near Shermansville on March 8, 1925, were arrivals from the south. Mr. Langdon saw others near Conneaut Lake but two days later. On April 27, 1922, two pairs with nests were found by us near Hartstown. On May 1, 1922, a nest with five fresh eggs and the male parent were collected at Crystal Lake. The nest was built in the deserted cavity of a Hairy Woodpecker. A nest ready for eggs was found near Hartstown on May 6, 1922. The dates just mentioned are doubtless a little late, for young birds one-third grown were found near Stony Point on May 7, 1922, and young just ready to leave the nest were observed on May 16, 1923. A brood of very small young found June 1, 1924, in a telegraph pole along the road may have been a second brood. Nests with young were found on May 14 and 16, 1925.

The post-juvénal moult was not complete on August 26, 1925. On September 24, flocking Bluebirds were abundant and noisy north of Hartstown. Mr. Kirkpatrick noted migrating flocks at Meadville on October 12, 1896.